# MECH BRIGADE™

## A SIMULATION OF MODERN ARMORED WARFARE

SSI™

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Always make sure to include your name, address, and daytime telephone number with any correspondence. We will do our best to see that any problems are corrected as soon as possible.

# TABLE OF CONTENTS


1.0 INTRODUCTION ..... 1
Description of Action • Talking to the Computer • Saving a Game
The Map • Starting the Game (Apple) • Starting the Game (Atari)
Starting the Game (Commodore) • Sound

2.0 GENERAL DESCRIPTION ..... 1
Parts Inventory • Abbreviations

3.0 STARTING THE GAME ..... 1
Determining Conditions of Play • Player Determination • Handicap Level
Delay Length • Selecting a Scenario • Building the Map
Selecting the Type of Battle • Selecting NATO Nationality • Selecting Forces

4.0 DEPLOYMENT ..... 2
Combat Formations • The Map Display • Unit Symbols
Map Display Menu • Unit Deployment Menu • The Objective Area
Saving the Set-Up • Entrenchments • Changing the Map
Changing Weapon Types of Armored Vehicles • Visibility Level

5.0 ORDERS PHASE ..... 3
Map Display Menu • Unit Orders Menu • All-Units Mode • Embarking Units
Movement Objectives • Requesting Artillery Bombardments
Setting Target Selection Range • The Inspect Routine • Ending the Game
Time • Execution Delays • Command Control

6.0 WEAPONS ..... 5
Special Infantry Weapons

7.0 COMBAT PHASE ..... 6
Searching • Selecting Targets • Direct Fire vs. Vehicles and Helicopters
Direct Fire vs. Non-Vehicle Targets • Indirect Fire • Suppression
Suppression Effects • Ammunition • Movement • Disembarking Under Fire
Combat Reports • Sighting Firing Units • Smoke • Helicopters

8.0 LINE OF SIGHT ..... 8

9.0 HISTORICAL SCENARIOS ..... 10
General Custer Rides Again (FULDA May 8, 1990)
Hold the Line (WURZBURG May 11, 1990)
The Tide Begins to Turn (KARLSRUHE May 25, 1990)
Into the Jaws (OLDENBURG May 26, 1990)

10.0 GAME LENGTH AND VICTORY CONDITIONS ..... 10
Ending the Game • Victory Conditions

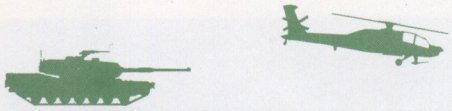
11.0 WEAPONS NOTES ..... 11

12.0 STRATEGY NOTES ..... 16
Deployment • Command Control • Firing on the Move
APC's, Infantry, and Smoke • Smoke • Weapons • Helicopters
Special Infantry Weapons • Suppression • The Combined Arms Concept

APPENDIX 1: Kill Probabilities ..... 17

APPENDIX 2: Program to Determine Kill Probabilities for Direct Fire vs. Armored Vehicles .... 17

APPENDIX 3: Terrain Symbols ..... 18



# 1.0 INTRODUCTION

MECH BRIGADE is a platoon level tactical game of hypothetical future combat between the forces of NATO and the Soviet Union.

### 1.1 Description of Action:

Each game turn consists of two phases. In the orders phase, the players, one at a time, give orders to the units which they control. In the joint combat phase all units carry out these orders, one unit at a time. The combat phase represents two minutes of action, broken down into four 30-second pulses.

### 1.2 Talking to the Computer:

To enter a response to the computer that consists of numbers, type the number into the computer and press the <RETURN> key. To select a routine from a menu or answer a Yes/No question, just press the desired key.

WHERE THE EXIT COMMAND IS NOT SPECIFIED, PRESS <X> TO EXIT THE MENU.

### 1.3 Saving a Game:

At the end of the DEPLOYMENT PHASE and at the end of each COMBAT PHASE, the computer will allow the player(s) to save the game in progress. You will need a scratch disk to store the save game data. Save game disks may be initialized for SSI use during a game by following instructions included in the game program. Each save disk will hold approximately 4-6 games. *(Warning: the program will not inform you when you have exceeded the disk space on your save game disk.)* Once a game is saved you will be able to restart it at the point you left off.

WHEN RESTARTING A SAVED GAME YOU MUST SET THE CORRECT NUMBER OF PLAYERS ON THE OPENING MENU.

### 1.4 The Map:

The MECH BRIGADE map is a 60 × 40 square grid with each square measuring 200 yards across. At the start of each game the terrain is randomized in accordance with parameters determined by the players.

### 1.5 Starting the Game (Apple):

To begin the game, boot side one and the game will begin automatically. If you are using an Apple II with Pascal you must first use your BASICS disk. If you are using an Apple III you must first go into Apple II emulation mode. If you elect to play a historical scenario, the computer will ask you to insert side two of the disk so that it may read in the scenario data. When this is complete the computer will instruct you to reinsert side one for the remainder of the game.

### 1.6 Starting the Game (Atari):

To begin the game, boot the Scenario side of your disk. Before beginning remove all cartridges from your computer. Owners of the 800XL will have to hold down the OPTION key when they turn on their computer to boot the game. After you have deployed your forces (or after you have selected to play a historical scenario), the computer will ask you to insert the Game side of your disk.

### 1.7 Starting the Game (Commodore):

To begin the game, insert the game disk into your disk drive. Type
LOAD"*",8 and press <RETURN>. When READY appears, type RUN and press <RETURN>.

### 1.8 Sound:

During the combat phase players may toggle the sound ON/OFF by pressing the "S" key.

# 2.0 GENERAL DESCRIPTION

### 2.1 Parts Inventory:

a. Game box
b. Rule book
c. 5¼" game disk
d. One data card

### 2.2 Abbreviations:

Abbreviations used in the game are listed below:

| | |
|---|---|
| BDE | brigade |
| CO | company |
| BN | battalion |
| MECH | mechanized |
| MOT | motorized |
| PZG | panzergrenadier |
| PZ | panzer |
| JPZ | jagdpanzer (tank destroyer) |
| INF | infantry |
| RIF | rifle |
| ART | artillery |
| AT | anti-tank |
| MOR | mortar |
| HOW | howitzer |
| ATGM | anti-tank guided missile |
| SAM | surface-to-air missile |
| GS | general support |
| CS | close support |
| AD | air defense |
| AH | attack helicopter |

# 3.0 STARTING THE GAME

### 3.1 Determining Conditions of Play:

At the start of the game the player(s) must determine the conditions under which the game will be played. On the Apple® version the conditions may be changed by entering the following numbers:

(1) NEW GAME or SAVED GAME
(2) 1 DISK DRIVE or 2 DISK DRIVES
(3) SOLITAIRE or TWO PLAYERS
(4) HANDICAP LEVEL
(5) DELAY LENGTH
(6) SELECT SCENARIO

On the ATARI® and COMMODORE 64™ versions:

(1) NEW GAME or SAVED GAME
(2) SOLITAIRE or TWO PLAYERS
(3) HANDICAP LEVEL
(4) DELAY LENGTH
(5) SELECT SCENARIO

### 3.2 Player Determination:

MECH BRIGADE may be played by either zero, one, or two players, and this is determined by the option selected on the menu. For example, if you wished to watch a computer controlled NATO force face a computer controlled Russian force, you should select the option BOTH COMPUTER.

### 3.3 Handicap Level:

At the start of the game the players must determine the handicap level (1-5). The effects of the handicap levels are listed below:

Level 1: NATO strength reduced 50%
Level 2: NATO strength reduced 25%
Level 3: No reduction
Level 4: Soviet strength reduced 25%
Level 5: Soviet strength reduced 50%

EXAMPLE: At level 1 the number of weapons in NATO platoons would be reduced by approximately 50%.

The handicap level will not affect the four "historical scenarios", as the computer will automatically assign a handicap level of 3 when these scenarios are played.

### 3.4 Delay Length:

The delay length affects messages displayed during the Combat Phase. The greater the delay length, the longer these messages will remain displayed during the Combat Phase. A delay length of 0 will speed up the game, but will cause the messages to be virtually unreadable. A delay length of 9 will slow the game considerably, but will allow the player maximum time to study the various reports provided during the Combat Phase. Any integer between 0 to 9 may be entered.

### 3.5 Selecting a Scenario:

You may select one of the four historical scenarios (see section 8.0), or you may elect to build your own scenario. If you select a historical scenario, the computer will skip the deployment phase and go directly to turn 1. If you elect to build your own scenario you will be asked several questions (see sections 3.6–3.9). New players are advised to begin by playing scenarios they have created. Creating and playing a small meeting engagement is recommended. Do not attempt to play the historical scenarios until you are completely familiar with the game.

### 3.6 Building the Map:

At the start of the game the computer will generate a new map. Prior to generating the map the computer will allow the player(s) to input parameters that influence the nature of the terrain:

(1) INCLUDE RIVER Y/N
(2) COVER TERRAIN DENSITY (0-9)

If option (1) is answered "Y" then the map will include a river. Option (2) allows the players to control quantity of woods and broken terrain included on the map. A "0"

would allow no woods/broken terrain on the map; a "9" would mean heavy woods/broken terrain density. Any number between 0 and 9 may be entered.

### 3.7 Selecting the Type of Battle:

The player(s) may select from five different types of battle:

(1) NATO PURSUIT
A small Soviet force fights a rear-guard action against a large NATO force.

(2) NATO ASSAULT
A large NATO force attacks a medium Soviet force. Both sides may use off-map artillery.

(3) MEETING ENGAGEMENT
Opposing forces of equal strength advance on the same objective.

(4) SOVIET ASSAULT
A large Soviet force attacks a medium NATO force. Both sides may use off-map artillery.

(5) SOVIET PURSUIT
A small NATO force fights a rear-guard action against a large Soviet force.

The player(s) must also determine the size of the battle:

(1) LARGE
(2) SMALL

In a "small" battle the quantity of units on both sides will be reduced by approximately 50%.

### 3.8 Selecting NATO Nationality:

The NATO player may choose to use the equipment and organizations of the following countries: (1) U.S. (2) WEST GERMANY (3) GREAT BRITAIN (4) FRANCE.

### 3.9 Selecting Forces:

First the players must decide to use either OLD or NEW EQUIPMENT. The player will receive 25 additional selection points if he chooses OLD equipment.

The players have a limited number of selection points (SPs) that they may use to "buy" various types of companies, battalions or regiments. The computer will only allow the selection of formations that are appropriate for the type of force selected.

Before each game, the computer will randomly determine which player has air superiority. That player will be allowed to purchase up to one attack helicopter squadron (AH squadron).

The player(s) will receive 20 victory points for each SP that is not used to buy formations. A maximum of 250 points may be received in this manner.

If the AUTO-SELECT routine is used, then the computer will select a force to suit the type of battle. The AUTO-SELECT will never purchase helicopter or independent air-defense units.

## 4.0 DEPLOYMENT

When creating a new scenario, the player(s) may arrange their units on the map before the game begins to optimize their attack or defense. Soviet units may not be deployed west (left) of their "start line" and NATO units may not be deployed east (right) of their "start line". If the AUTO-DEPLOY routine is used, then the computer will automatically deploy the units on the map. AUTO-DEPLOY will not provide the *best* possible deployment; it represents a "hasty" deployment. If the AUTO-DEPLOY routine is not used, the players will find their units at the top of the map.

### 4.1 Combat Formations:

All units in the game are organized into combat formations (CFs). CFs consist of a headquarters (HQ) unit with from 1 to 8 attached combat units.

CFs are each assigned an identification letter (A-U). The units attached to a CF are each assigned an index number (0-10). The formation letter and the index number are combined to form the unit ID.

EXAMPLE: the 3rd unit in formation C would have C3 as its UNIT ID.

The HQ unit in all CFs will be assigned index number "0".

### 4.2 The Map Display:

The map display used in MECH BRIGADE is a 60 × 40 square grid. Only a fraction of the map (20 squares wide by 10 squares high) may be viewed at one time. By pressing the keys 1-8 the cursor can be moved around the map (1-N, 2-NE, 3-E, 4-SE, 5-S, 6-SW, 7-W, 8-NW). If the cursor is moved to the edge of the display then the map will scroll to reveal the hidden portions of the map.

When playing an assault type battle, the map is reduced to 60 × 20 (60 spaces east-west by 20 spaces north-south).

### 4.3 Unit Symbols:

All units on the map are identified by symbols that describe their function and nationality.

SOVIET VEHICLES are represented by vehicle silhouettes facing west.

SOVIET INFANTRY is represented by symbols of two men underlined.

SOVIET ARTILLERY is represented by an underlined weapon symbol.

SOVIET STACK is represented by two overlapping white squares.

NATO VEHICLES are represented by vehicle silhouettes facing east.

NATO INFANTRY is represented by symbols of two men (no underline).

NATO ARTILLERY is represented by a weapon symbol (no underline).

NATO STACK is represented by two hollow overlapping squares.

CONFLICT (opposing forces on same square) is represented by an SU / NA symbol.

### 4.4 Map Display Menu:

The map display menu lists the following routines:

(1-8) Move cursor.
(9) Build entrenchment (only before ASSAULT type battles).
(0) Use auto-deploy routine.
(A-T) Select unit. Press formation letter followed by unit index number — computer will shift to UNIT ORDERS MENU. **(If a unit has an index number of 10, press the (T) key.)**
(U) Change terrain in square (see appendix 3 for terrain key).
(V) View. Inverses all squares with a line of sight to the cursor location.
(W) Move cursor to OBJECTIVE AREA (see 4.6) then START LINE.
(X) Exit deployment phase.
(Y) Clear units and smoke from screen to view terrain.
(Z) Examine friendly units at cursor location.

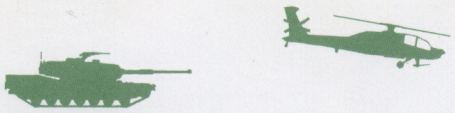
### 4.5 Unit Deployment Menu:

The unit described at the top of the text window is the "current unit". The following routines may be used to adjust the starting location or inspect the status of the current unit:

(1-8) Move cursor.
(9) Change weapon type of armored vehicle.
(D) Disembark unit. If unit is a vehicle then it will unload all of its passengers; if the unit is a passenger then only that unit will unload.
(E) Embark unit. Order must be given to a vehicle unit — the computer will request the ID of the unit to be embarked.
(L) Look for unit. The cursor will move to the unit's location.
(M) Move unit. The unit will move to the cursor location.
(N) Next unit. The next higher numbered unit will become the current unit.
(P) List passengers. Will list the units embarked aboard the current unit.
(Q) Quit the orders menu. Return to the map display menu.
(V) View. Inverses all squares that may be seen from the cursor location.
(X) Exit the unit orders menu. Return to the map display menu.

### 4.6 The Objective Area:

The objective area may be located by pressing the (W) key on the map display menu. The cursor will move to the CENTER of the objective area. The objective area is a 19 × 19 square area. In some scenarios the players will score points for each infantry



man, gun or vehicle that ends the game in the objective area.

### 4.7 Saving the Set-Up:

At the conclusion of the deployment phase the computer will allow you to save the set-up on a disk initialized for SSI use (disks may be initialized at this time).

### 4.8 Entrenchments:

If the type of battle is a SOVIET ASSAULT or NATO ASSAULT then the players may "build" entrenchments for their units. Entrenchments are built by moving the cursor over a clear terrain square and pressing the "9" key when the computer is in MAP DISPLAY MODE.

Players may build a maximum of 50 entrenchments. Entrenchments may only be built on the friendly side of the start line.

### 4.9 Changing the Map:

During the deployment phase, players may use the U key to create any terrain desired on any square of the map. This allows players to create any map desired. More the cursor to the square you wish to change, type U, and then type the number of the terrain (see appendix 3 for a list of terrain types). When designing a map, keep in mind that often the computer intelligence cannot deal with river terrain.

### 4.10 Changing Weapon Types of Armored Vehicles:

Players wishing to create their own scenarios may change the weapon type of any of the armored vehicles. To change a unit's weapons go to the unit orders menu, type 9, and then type the number of the weapon desired for the current unit (see section 6.0 for weapon numbers). *Warning: A unit's ammunition will not change when a weapon type is changed. Also, use caution when changing to or from weapons that use ATGM's or SAM's. Do not change a rifle platoon into another weapon type.*

### 4.11 Visibility Level:

At the end of the deployment phase of each game, the computer will randomly determine the visibility level. The visibility level will be set between 7 and 20 and will remain constant throughout the game. The visibility level is the maximum range at which units may spot and direct fire at enemy units.

## 5.0 ORDERS PHASE

During the orders phase the player(s) may review the status of their units and assign movement, bombardment and targeting orders.

### 5.1 Map Display Menu:

The map display menu used during the orders phase is similar to the one used during the deployment phase.

(1-8) Move cursor.

(0) End game.

(A-U) Select unit. Press formation letter followed by unit index number — computer will shift to UNIT ORDERS MENU; the selected unit will be the "current unit". **(If a unit has an index number of 10, press the (T) key.)**

(V) View. The computer will inverse all squares that can be seen from the cursor location.

(W) Move cursor to center of objective area.

(X) Exit orders phase.

(Y) Clear units and smoke from screen to view terrain.

(Z) Examine friendly or visible enemy units at cursor location.

### 5.2 Unit Orders Menu:

Upon selecting a unit from the map menu it will be displayed beneath the map showing its composition (number and type of vehicles or weapons), ammunition (shown as A, in pulses of firing remaining), facing (shown as a compass direction), speed (in movement point rate, it is also miles per hour), and whether it's loaded (an L is displayed when loaded). The following routines may be used to assign orders to or inspect the status of the current unit:

(1-8) Move cursor.

(A)* Advance. This command is only used when the computer is in all-units mode; the formation HQ will move to the cursor location, other units in the formation will move in such a way as to retain their current position relative to the HQ.

(B) Bombard. The cursor location is the target square; the current unit is the spotter; the computer will list the artillery units eligible to bombard the target (see section 5.6).

(C) Center. The map is centered around the cursor.

(D) Disembark. If the current unit is a vehicle then it will unload all of its passengers; if the current unit is a passenger then only that unit will unload; unloaded passengers will have a suppression level of 80.

(E) Embark. Order must be given to a vehicle unit — the computer will request the ID of the unit to be embarked (see section 5.4).

(F)* Change unit facing.

(H) Find unit's HQ. Cursor moves to unit's HQ location; computer determines if a "command control" link exists between the current unit and the HQ; the HQ becomes the new current unit.

(I) Inspect. Allows the player to inspect all enemy units that can be seen by the current unit; allows the current unit to designate a priority target and/or request a bombardment (with the current unit as the spotter). Assigning a priority target with the (I)nspect order will cause a range order to be given if the target is outside of the set maximum range, with the maximum firing range being set equal to the distance to the new target (see section 5.8).

(K)* Cancel all orders. Allows the current unit to cancel all movement and bombardment orders.

(L) Look for unit. Moves the cursor to the current unit's location.

(M)* Move unit. Orders the unit to move to the cursor location (see section 5.5).

(N) Next unit. The next higher numbered unit will become the current unit.

(O) Check movement objectives. Moves the cursor to the movement objective location(s) of the current unit; also lists the command control delay (see section 5.5).

(P) List passengers. Lists all units embarked aboard the current unit.

(Q) Quit the unit orders menu. Return to the map display menu.

(R)* Set maximum firing range at which the current unit will select targets (see section 5.7).

(S)* Set movement speed for the current unit. Helicopter speeds will be in increments of 10. This routine will allow helicopters to change altitude before setting their speed.

(T) Inspect the target that the current unit has selected.

(V) View. The computer will inverse all squares that the current unit can see with its current facing.

(X) Exit the unit orders menu. Return to the map display menu.

(Z) Shift to all-units mode.

### 5.3 All-Units Mode:

Certain orders may be given to all of the units of a particular formation. These orders are followed by an "*" in the listing in 5.2. The computer may be placed in "all-units mode" by pressing the letter "A" instead of the unit index number when selecting a unit from the map display menu. From the unit orders menu the player may shift to "all-units mode" by pressing the (Z) key.

EXAMPLE: If the current unit is C4 and the (Z) key is pressed, then the computer will shift to all-units mode for formation C. C-ALL will be shown at the top of the text window and C0 will become the new current unit.

When the computer is in all-units mode then the current unit will always be the formation HQ. The computer may not be

placed in all-units mode if the formation HQ has been destroyed.

### 5.4 Embarking Units:

All vehicle units may embark infantry type units. Only APC units may embark artillery or ATGM type units. Each vehicle may carry a maximum of 10 transport points. Transport costs for each type of passenger unit are listed in the WEAPONS DATA TABLE.

EXAMPLE: a platoon with 30 RIFLEs would require 3 vehicles to transport.

EXAMPLE: a battery of 8 MILAN ATGMs would require 2 APCs to transport.

The following command/recon vehicles may be used as APCs for transport purposes: VAB, BRDM.

After giving the (E)MBARK command the player must enter the ID of the unit to be embarked. The embarking unit must be in the same square as the vehicle unit. It is possible to instruct an APC to embark all of it's attached units. Type the letter "A" instead of the index number of the passenger unit.

### 5.5 Movement Objectives:

Movement objectives may be assigned to the current unit by moving the cursor to the desired objective location, pressing the (M) key and then entering the desired speed.

Each unit may store up to 2 movement objectives. The FIRST OBJECTIVE will always be the first objective assigned and the SECOND OBJECTIVE will always be the LAST one assigned. When a unit completes its move to the first objective location then the second objective will become the NEW first objective. If a new objective is assigned to a unit that already has two objectives, then the new objective will replace the old second objective.

Command control movement delays are imposed each time a new movement objective is assigned. Delays are not cumulative; the new delay will replace any existing delay.

Movement objectives for the current unit may be reviewed by pressing the (O) key. Movement objectives for the current unit may be cancelled by pressing the (K) key.

### 5.6 Requesting Artillery Bombardments:

Indirect-fire artillery bombardments may be performed by all mortars, self-propelled artillery, and towed artillery. Any unit on the map may REQUEST a bombardment.

To request a bombardment move the cursor to the desired target square and press the (B) key. The computer will list units that are in range and capable of performing bombardments. If you wish to assign the displayed unit to a bombardment mission press the (B) key. If you wish to assign the displayed unit to a smoke mission press the (S) key. If you wish to skip to the next unit without assigning the displayed artillery unit then press the (N) key. If you wish to exit the bombardment routine press the (Q) key.

For each artillery unit displayed during the bombardment routine, the computer will display the DELAY required before the artillery can start firing. The delay is dependent on the relationship between the requesting unit and the artillery unit:

(1) if the requesting unit is an HQ and the artillery unit is part of the same formation then there will be a 2 pulse delay.

(2) if the requestor is a non-HQ but the artillery is part of the same formation then there will be a 4 pulse delay.

(3) if the requestor is the COMMAND HQ then there will be a 4 pulse delay.

If none of the above cases apply, then there will be an 8 pulse delay. If more than one of the above cases apply, then the one with the shortest delay will be used. Off-map artillery is considered to be in the same formation as the COMMAND HQ.

When a unit is ordered to bombard, or when a mortar unit begins to fire, the unit's maximum firing range is set to zero. Do not change this until the bombardment is completed; otherwise the unit may cancel its bombardment.

### 5.7 Setting Target Selection Range:

Units will automatically select direct fire targets during the combat phase. The players may prevent their units from selecting targets at extreme ranges by adjusting the unit's target selection range. The target selection range may be adjusted by using the (R) routine. **All units begin with their target selection range set to 0.**

EXAMPLE: A T-72 tank unit has its selection range set to 5; the unit will only select targets at ranges of 5 or less even though the T-72 weapon has a maximum range of 18.

When a unit fires an ATGM, the unit will automatically set its target selection range to the weapon's maximum range.

### 5.8 The Inspect Routine:

The (I)NSPECT routine may be used to review all enemy units that can be seen by the current unit. The cursor will move to the position of each sighted enemy unit and the player will be allowed to request a bombardment or designate the enemy unit as a PRIORITY TARGET for the current unit.

The priority target feature allows the player(s) the option of controlling the target selection of their units. If the priority target feature is not used then the units will automatically select targets during the combat phase.

### 5.9 Ending the Game:

The player(s) may use the (0) routine on the map display menu to end the game at any time. The computer will automatically end the game after turn 20 for assault scenarios and after turn 15 for all other scenarios. Players who wish to continue playing a game beyond its normal limits may do so. If you elect not to continue the game, the computer will reset the game as a two-player game in order to allow you to examine both side's units.

### 5.10 Time:

During the combat phase, 2 minutes of actions are resolved. The combat phase is divided into 4 PULSES of 30 seconds each.

### 5.11 Execution Delays:

When units receive new movement or bombardment orders there will be a delay, expressed in PULSES, before the orders can be executed (see 5.5, 5.6, 5.12). Units that use the (K) cancel routine will have a 1-pulse delay added.

### 5.12 Command Control:

Both players will start the game with a COMMAND HQ unit. For the Soviets, French and British this will be a division unit with an "xx" symbol. For the U.S. and West Germans this will be a brigade unit with an "x" symbol.

A unit is considered to be "in command control" if an unbroken "chain of command" exists between the unit and the COMMAND HQ. To determine command control the computer will examine each link in the chain of command.

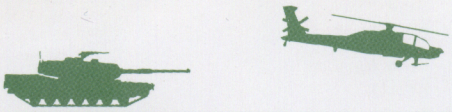
To establish a command control link between a non-HQ unit and its formation HQ, the unit may not be more than 10 spaces from the HQ. If the unit cannot "see" the HQ, then the maximum distance is 5 spaces.

A command control link between an HQ unit and its next higher HQ will always exist until one of the units is destroyed.

EXAMPLE: For an infantry platoon to be in command control it would have to establish a command control link with its company HQ, the company HQ would have to be linked with its battalion HQ and the battalion HQ would have to be linked to the command HQ.

To determine the chain of command for any unit, use the (H) routine from the unit orders menu. Continue pressing the (H) key until the cursor moves to the command HQ.

Units that receive new movement orders will be delayed a number of pulses before they start moving. The length of the delay varies with the command control status and nationality of the unit. NATO units that are "in command control" will have a 1-pulse delay. NATO units that are "out of command control" will have a 5-pulse delay. Soviet units that are "in command control" will have a 3-pulse delay. Soviet units that are "out of command control" will have a 7-pulse delay. Helicopter units never incur movement delays.



## 6.0 WEAPONS

The weapons used in MECH BRIGADE are listed below.

### HELICOPTERS

| # | WEAPON | MR | MP | SS | AC | SP | MG | FA | BA | SL | GM | USE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **helicopters** | | | | | | | | | | | | |
| 0 | COBRA | 5 | 12 | 2 | 50 | 27 | 1 | 2 | 2 | 3 | TO | US-O |
| 1 | APACHE | 14 | 18 | 2 | 50 | 30 | 0 | 3 | 3 | 3 | HE | US-N |
| 2 | PAH-2 | 5 | 12 | 2 | 50 | 27 | 0 | 2 | 2 | 3 | HO | WG-A |
| 3 | LYNX-3 | 5 | 12 | 2 | 50 | 22 | 0 | 1 | 1 | 3 | TO | BR-A |
| 4 | HIND-D | 5 | 12 | 2 | 50 | 26 | 0 | 2 | 2 | 4 | SI | SU-A |

### VEHICLES

| # | WEAPON | MR | MP | SS | AC | SP | MG | FA | BA | SL | GM | USE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **tanks** | | | | | | | | | | | | |
| 5 | M60A3 | 18 | 44 | 5 | 50 | 15 | 2 | 19 | 7 | 5 | N | US-O |
| 6 | ABRAMS | 18 | 48 | 5 | 50 | 28 | 2 | 36 | 12 | 4 | N | US-N |
| 7 | LEOPRD1 | 14 | 36 | 5 | 30 | 20 | 2 | 20 | 6 | 4 | N | WG-O |
| 8 | LEOPRD2 | 18 | 48 | 5 | 50 | 28 | 2 | 36 | 12 | 4 | N | WG-N |
| 9 | CHIEFTN | 20 | 48 | 5 | 50 | 15 | 2 | 24 | 8 | 5 | N | BR-O |
| 10 | CHALNGR | 20 | 48 | 5 | 50 | 20 | 2 | 36 | 12 | 4 | N | BR-N |
| 11 | T-55 | 14 | 30 | 5 | 20 | 15 | 2 | 15 | 7 | 3 | N | SU-O |
| 12 | T-62 | 14 | 34 | 5 | 20 | 15 | 1 | 16 | 6 | 3 | N | SU-A |
| 13 | T-72 | 18 | 45 | 5 | 50 | 20 | 2 | 20 | 7 | 3 | N | SU-A |
| 14 | T-80 | 18 | 45 | 5 | 50 | 20 | 2 | 36 | 12 | 3 | N | SU-N |
| **self-propelled ATGM systems** | | | | | | | | | | | | |
| 15 | M150 | 5 | 0 | 1 | 50 | 20 | 0 | 4 | 2 | 3 | TO | US-O |
| 16 | M901 | 5 | 0 | 1 | 50 | 20 | 0 | 8 | 4 | 3 | TO | US-N |
| 17 | JAGUAR1 | 3 | 0 | 1 | 50 | 20 | 0 | 8 | 3 | 3 | HO | WG-A |
| 18 | FV438 | 3 | 0 | 1 | 50 | 16 | 0 | 4 | 2 | 3 | SW | BR-A |
| 19 | BRDM-2 | 5 | 0 | 1 | 50 | 12 | 0 | 2 | 1 | 3 | SA | SU-O |
| 20 | BRDM-3 | 5 | 0 | 1 | 50 | 12 | 0 | 2 | 1 | 3 | SP | SU-N |
| **recon/command vehicles** | | | | | | | | | | | | |
| 21 | M577 | 5 | 0 | 1 | 50 | 20 | 0 | 4 | 2 | 4 | N | US-A |
| 22 | LUCHS | 5 | 2 | 2 | 50 | 12 | 0 | 6 | 3 | 3 | N | WG-A |
| 23 | SPARTAN | 3 | 0 | 1 | 50 | 24 | 0 | 2 | 1 | 3 | N | BR-A |
| 24 | SCIMITR | 7 | 6 | 2 | 50 | 24 | 1 | 2 | 1 | 3 | N | BR-A |
| 25 | SCORPON | 7 | 12 | 4 | 20 | 24 | 1 | 2 | 1 | 3 | N | BR-A |
| 26 | BRDM | 5 | 0 | 1 | 50 | 12 | 1 | 2 | 1 | 2 | N | SU-A |
| **APC/MICV** | | | | | | | | | | | | |
| 27 | M113 | 5 | 0 | 1 | 50 | 20 | 1 | 4 | 2 | 3 | N | US/WG-O |
| 28 | BRADLEY | 10 | 8 | 2 | 50 | 28 | 1 | 10 | 6 | 3 | TO | US-N |
| 29 | MARDER | 5 | 2 | 2 | 50 | 21 | 2 | 10 | 3 | 4 | N | WG-N |
| 30 | FV-432 | 12 | 9 | 2 | 50 | 16 | 0 | 4 | 2 | 3 | N | BR-O |
| 31 | MCV80 | 12 | 9 | 2 | 50 | 20 | 1 | 10 | 4 | 3 | N | BR-N |
| 32 | BMP-1 | 7 | 30 | 4 | 10 | 18 | 1 | 4 | 2 | 2 | SA | SU-O |
| 33 | BMP-2 | 8 | 30 | 4 | 30 | 20 | 1 | 5 | 3 | 2 | SP | SU-N |
| **self-propelled mortars** | | | | | | | | | | | | |
| 34 | M106 | 28 | 0 | 5 | 9 | 20 | 1 | 4 | 2 | 3 | N | US-A |
| 35 | M125 | 24 | 0 | 4 | 9 | 20 | 1 | 4 | 2 | 3 | N | US-A |
| 36 | FV432M | 25 | 0 | 4 | 9 | 16 | 1 | 4 | 2 | 3 | N | BR-A |
| 37 | M113-M | 28 | 0 | 5 | 9 | 16 | 1 | 4 | 2 | 3 | N | WG-A |
| 38 | BTR-50M | 28 | 0 | 5 | 9 | 13 | 1 | 2 | 1 | 3 | N | SU-A |
| **self-propelled artillery** | | | | | | | | | | | | |
| 39 | M107 | 12* | 0 | 7 | 6 | 16 | 0 | 2 | 2 | 4 | N | WG-A |
| 40 | M109 | 12* | 0 | 6 | 8 | 17 | 1 | 2 | 2 | 4 | N | US/WG/BR-A |
| 41 | M110 | 12* | 0 | 8 | 6 | 16 | 0 | 2 | 2 | 4 | N | US/WG/BR-A |
| 42 | ABBOT | 12* | 0 | 5 | 8 | 15 | 0 | 2 | 1 | 4 | N | BR-A |
| 43 | M-1974 | 12* | 0 | 5 | 8 | 14 | 0 | 5 | 1 | 4 | N | SU-A |
| 44 | M-1973 | 12* | 0 | 6 | 8 | 13 | 0 | 2 | 1 | 5 | N | SU-A |
| **self-propelled flak** | | | | | | | | | | | | |
| 45 | SG.YORK | 15 | 4 | 2 | 40 | 15 | 0 | 8 | 4 | 5 | N | US-A |
| 46 | GEPARD | 15 | 3 | 2 | 50 | 20 | 0 | 18 | 6 | 4 | N | WG-A |
| 47 | ZSU23/4 | 15 | 2 | 2 | 50 | 14 | 0 | 1 | 1 | 3 | N | SU-A |
| **self-propelled SAM systems** | | | | | | | | | | | | |
| 49 | ROLAND | 25 | 0 | 5 | 80 | 21 | 0 | 5 | 2 | 4 | N | US/WG-A |
| 48 | SA-8 | 35 | 0 | 5 | 80 | 12 | 0 | 2 | 1 | 3 | N | SU-A |

### NON-VEHICLES

| # | WEAPON | MR | MP | SS | AC | SP | DF | CC | SL | GM | USE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **infantry weapons** | | | | | | | | | | | |
| 63 | LAW | 0 | 12 | 3 | 10 | – | – | – | – | – | US/BR-A |
| 64 | PZF44 | 0 | 12 | 3 | 15 | – | – | – | – | – | WG-A |
| 66 | RIFLE (NATO) | 2 | 0 | 1 | 50 | 6 | 9 | 1 | 1 | N | US/WG/BR-A |
| 65 | RPG-7 | 0 | 12 | 4 | 20 | – | – | – | – | – | SU-A |
| 67 | RIFLE (Soviet) | 2 | 0 | 1 | 50 | 6 | 9 | 1 | 1 | N | SU-A |
| **towed artillery** | | | | | | | | | | | |
| 68 | 130 GUN | 12* | 0 | 5 | 6 | 0 | 3 | 10 | 2 | N | SU-A |
| 69 | 180 GUN | 12* | 0 | 7 | 6 | 0 | 3 | 10 | 2 | N | SU-A |
| **SAM systems** | | | | | | | | | | | |
| 50 | RAPIER | 30 | 0 | 5 | 80 | 0 | 2 | 10 | 4 | N | BR-A |
| 51 | STINGER | 9 | 0 | 3 | 30 | 5 | 8 | 2 | 1 | N | US/WG-A |
| 52 | BLWPIPE | 6 | 0 | 3 | 20 | 5 | 8 | 2 | 1 | N | BR-A |
| 53 | SA-7 | 6 | 0 | 3 | 10 | 5 | 8 | 2 | 1 | N | SU-A |

| # | WEAPON | LR | MR | MP | AC | SP | DF | CC | SL | GM | USE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ATGMs** | | | | | | | | | | | |
| 54 | DRAGON | 1 | 8 | 30 | 80 | 5 | 8 | 2 | 1 | DR | US-A |
| 55 | TOW3 | 1 | 19 | 50 | 70 | 4 | 7 | 3 | 1 | TO | US/BR-A |
| 56 | HELLFRE | 3 | 20 | 60 | 90 | 3 | 6 | 5 | 1 | HE | US-N |
| 57 | MILAN | 1 | 10 | 30 | 60 | 5 | 8 | 2 | 1 | MI | WG/BR-A |
| 58 | HOT | 1 | 20 | 45 | 60 | 3 | 6 | 5 | 1 | HO | WG-A |
| 59 | SWGFIRE | 1 | 20 | 30 | 30 | 3 | 6 | 5 | 1 | SW | BR-A |
| 60 | SAGGER | 2 | 15 | 25 | 30 | 5 | 8 | 2 | 1 | SA | SU-O |
| 61 | SPANDRL | 1 | 15 | 40 | 60 | 3 | 6 | 5 | 1 | SP | SU-N |
| 62 | SPIRAL | 3 | 20 | 45 | 80 | 3 | 6 | 5 | 1 | SI | SU-A |

LR = minimum range
MR = maximum range; *- indicates max range of 99 when firing indirect
MP = maximum penetration
SS = shell size
AC = accuracy, ATGMs will have 99 accuracy when firing at greater than minimum range
SP = speed
MG = secondary machine guns
FA = frontal armor
BA = side/rear armor
DF = defense rating
CC = transport cost
SL = silhouette
GM = type of ATGM system
USE = using countries; N,O,A indicates if used in NEW, OLD or ALL formations

### 6.1 Special Infantry Weapons

All infantry PLATOONS in the game are armed with one of the following Special Infantry Weapons (SIWs): LAW, PZF-44, RPG-7. SIWs will only be used when firing at ZERO RANGE against ARMORED VEHICLES. SIWs will be fired instead of the platoon's normal RIFLE weapons. When using SIWs, the number of weapons firing is equal to NUMBER OF MEN in the platoon DIVIDED BY 3.

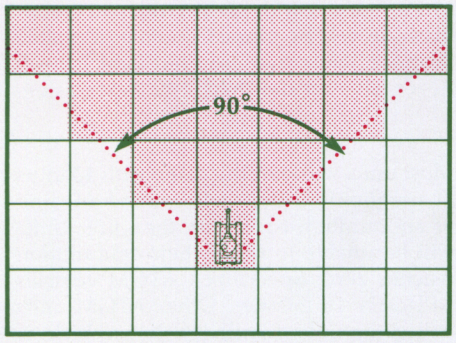
When SIWs are fired the target unit will automatically suffer 50 suppression.

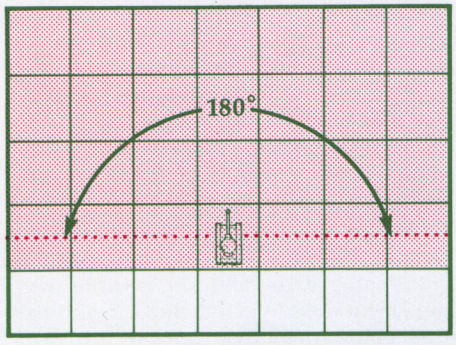
## 7.0 COMBAT PHASE

The combat phase of each turn represents 2 minutes of real time. The combat phase is divided into four 30-second pulses. During each pulse units may search, select targets, fire their weapons and/or move. Before each pulse the computer selects one player's units to move and fire first, with each side having a 50% chance of being first each pulse.

### 7.1 Searching

At the start of each pulse, eligible units will attempt to spot enemy units within their "field of vision". The field of vision is determined by the unit's facing and its movement status. Moving units have a 90 degree field of vision in the direction they are facing. Non-moving units have a 180 degree field of vision in the direction they are facing. Flak and SAM units will always have a 360 degree field of vision.




The enemy unit will be spotted if (1) it is within the searching unit's field of vision, (2) there is an unobstructed line-of-sight and (3) the enemy unit is within sighting range.

The SIGHTING RANGE equals the enemy unit's SL rating plus 1. If the enemy unit is in cover terrain then the sighting range is divided by 3. If the enemy unit is in "smoke" then the sighting range is divided by 2. If the enemy unit is moving then the sighting range is tripled. All sighting range adjustments are cumulative. The sighting range may never exceed Visibility Level (set at the start of the game).

Units that previously selected a target will not search if they are still eligible to fire at that target. Units may be unable to search due to suppression.

### 7.2 Selecting Targets

After searching, a unit will automatically attempt to select a target. A target must be a sighted enemy unit that is within target selection range (see 5.7). If there is more than one available target, then the nearest unit will be targeted. If the searching unit has a heavy armor-piercing weapon (MP rating greater than 30), then it will select the nearest TANK, if one is in range.

Units armed with ATGMs will fire those weapons only at vehicle targets. ATGM attacks will be resolved ONE PULSE AFTER they are fired. When a unit fires an ATGM, the unit will automatically set its target selection range to the weapons' maximum range. If the ATGM launch was sighted by the defending unit then that unit will automatically target the firing ATGM unit (but it will only return fire if the attacking unit is within the defending unit's target selection range). The defending unit will not target the firing ATGM if it also has an ATGM.

SAM units may only select helicopters as targets. Flak units may select non-helicopter targets if there are no helicopter targets available.

Units will attempt to select another target if their current target is an infantry unit with a suppression level of 200 at a range greater than zero (in some cases, this can lead units to temporarily cease fire). A unit will automatically change targets in order to shoot at an enemy unit that enters its square.

Once a target has been selected, it will never be lost as a target due to a change in the facing of the firing unit.

### 7.3 Direct Fire vs. Vehicles and Helicopters

Direct fire may kill or suppress vehicles or helicopters. The effectiveness of direct fire is determined by (1) weapon accuracy, (2) the number of weapons in the firing unit, (3) shell size, and (4) armor vs. penetration. ATGMs may not fire at helicopters.

CANNON AND SAM ACCURACY:

(1) At zero range accuracy will be (90 + (WEAPON ACCURACY × TURNS FIRED AT TARGET) )SQUARED/100.

(2) At maximum range accuracy will be (1 + (WEAPON ACCURACY × TURNS FIRED AT TARGET) )SQUARED/100. Weapon accuracy ratings are listed in section 6.0.

(3) Accuracy is DIVIDED BY 3 if the target unit occupies a TOWN, WOODS or ENTRENCHMENT terrain square and has its current speed set to 0. Accuracy is not DIVIDED BY 3 when firing at helicopters flying over cover terrain.

(4) If the target unit is moving, then accuracy will be divided by 2 + (speed/10).

(5) If the firing unit is moving, then accuracy will be divided by 2 + (speed/10).

(6) Accuracy is multiplied times the TARGET SILHOUETTE / 4.

(7) Accuracy is reduced when firing through cover terrain and/or smoke. The accuracy adjustment equals ACCURACY × 2 / (2 + BLOCKING POINTS). Blocking points for cover terrain are: TOWN = 4, WOODS = 2. Blocking points for smoke equals the smoke level in the square (0-3). Cover terrain in the attacker's or target's square will not add blocking points. Smoke in the attacker's or target's square does add blocking points.

(8) Accuracy is divided by 10 against helicopters unless the firing unit is a SAM or Flak unit.

ATGM ACCURACY:

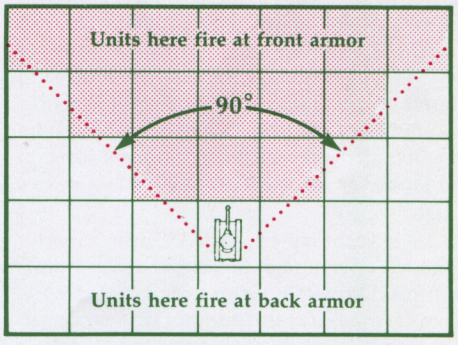
(1) Equals weapon accuracy rating × 2. If firing at a range GREATER than the weapon's MINIMUM range then the weapon accuracy rating will be 99. If firing at a range EQUAL to the weapon's MINIMUM range then use the accuracy rating listed in 6.0.

(2) If the ATGM's suppression is greater than 25 then accuracy will be QUARTERED.

(3) Accuracy adjustments 3, 4, 6 and 7 for CANNON weapons also apply to ATGMs.

KILLS:

(1) Armored vehicles are rated for both front and back armor. Front armor (FA) protects the front 90 degrees of the vehicle (see diagram). Back armor protects the remaining 270 degrees of the vehicle. When




firing at a range of zero, it is assumed that the fire is directed at the back armor of the target.

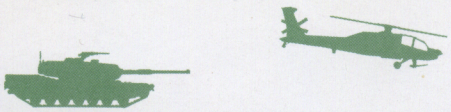
(2) Weapons are rated for maximum penetration (MP). MP ratings are modified by range and shell size (SS) into an ADJUSTED PENETRATION FACTOR (APF). The formula for APF is: ((SS × SS) / 4) + MP − (MP × (RANGE / MAX RANGE) / 2).

(3) The APF may not exceed 2 × ARMOR.

(4) If the APF is less than 1.25 × ARMOR then the ACCURACY is HALVED. If the APF is less than ARMOR then the ACCURACY is HALVED again.

(5) The number of KILLS equals APF × ACCURACY × NUMBER OF WEAPONS FIRING / (ARMOR × 1000).

EXAMPLE: Let's assume that 5 M60A3 tanks and 10 T-72 tanks are in clear terrain exchanging fire at a range of 6, with each target's front armor facing the enemy and a



level 2 smoke square in between the two units. The ACCURACY of the M60A3's is:

$= ( ( (12/18) \times 90) + (50 \times 1))^2)/100$

$= (110 \times 110)/100$

$= 121$

This accuracy is adjusted by the target silhouette which is 3, so the adjusted accuracy is equal to 90.75 ($121 \times (3/4)$ ). Due to the smoke square the accuracy is adjusted to 45.38 ($90.75 \times 2/ (2 + 2)$ ).The APF of the M60A3's is:

$= ( (5 \times 5)/4) + 44 - ( (44 \times (5/18) )/2)$

$= 25/4 + 44 - 110/18$

$= 44.14$

Since the APF is greater than 2 times the armor of the T-72, the APF is set to 40 ($2 \times 20$). The number of kills due to the fire of the M60A3's is:

$= 40 \times 45.38 \times 5/(20 \times 1000)$

$= .4538$

This means that there is roughly a 45.38% chance that one T-72 will be destroyed.

If the same calculation was made for the fire of the 10 T-72's the result would be a kill number of 1.51 which would usually lead to the destruction of 1 M60A3 and a 51% chance of the destruction of a second M60A3. Due to the large silhouette of the M60A3, and the fact that they are outnumbered 2 to 1, an engagement of this type would quickly lead to a NATO defeat. If, however, the NATO player had 5 ABRAMS, they would fire with a kill number of .454 while the T-72's would fire with a kill number of .368. This is a much better situation for the NATO player, although he might still need to bring up another platoon of tanks to win the engagement.

### 7.4 Direct Fire vs. Non-Vehicle Targets

The effectiveness of direct fire against non-armored targets is determined by (1) weapon accuracy, (2) the number of weapons in the firing unit, (3) shell size, and (4) target defense strength.

ACCURACY: Calculated the same as cannon accuracy in 7.3 with the following exceptions:

(1) When firing at MOVING non-vehicle targets, the accuracy is DOUBLED.

(2) Accuracy is DIVIDED BY 6 if the target is defending in WOODS, TOWN or ENTRENCHMENT terrain, irrespective of the unit's current speed setting.

(3) Silhouette ratings do not affect accuracy when firing at non-armored targets.

(4) The accuracy is not squared and is not divided by 100.

KILLS:

(1) Number of KILLS equals SS × SS × ACCURACY × NUMBER OF WEAPONS FIRING / (DEFENSE × 1000).

(2) If the firing unit is in the same square as the target unit and the target's suppression level is greater than 99%, then the target will defend with a DEFENSE of 1 and the attacker's accuracy is multiplied by 2.

(3) If the firing unit is an armored vehicle and the range is less than 6 then attacker will add its MG strength to enhance the attack.

### 7.5 Indirect Fire

All bombardments and mortar fire constitute indirect fire. Indirect fire will not yield reports of kills and suppression; however it will report when a unit has been eliminated.

The effectiveness of indirect fire is determined by (1) the view of the spotter, (2) shell size, and (3) target defense strength or armor. For indirect fire, armored vehicles have ARMOR equal to (BACK ARMOR + FRONT ARMOR) / 3.

ACCURACY: Calculated the same as 7.3 and 7.4 except for the following:

(1) The range is always considered to be the weapon's maximum range for the purpose of calculating accuracy.

(2) The pulses fired at the target equals zero if the spotter unit does not have a line of sight to the target square.

(3) The pulses fired equals 1 if the spotter unit cannot see the enemy unit in the target square.

(4) The pulses fired equals 4 if the spotter unit can see an enemy unit in the target square.

KILLS: Calculated the same as in 7.3 or 7.4.

Indirect fire attacks each enemy unit in the target square. If a friendly unit is present in the target square then the indirect fire mission will be canceled immediately.

If the spotter is unable to see the target square then the fire will "drift" into an adjacent square which will become the new target. Smoke target squares will always drift in this manner.

Indirect fire missions will normally continue firing for 4 pulses after which the firing units will become available for reassignment.

Smoke will never destroy or suppress enemy units in the target square. Smoke will inhibit sighting and reduce direct fire accuracy.

Indirect fire will never affect helicopter units.

### 7.6 Suppression

Suppression will occur during most direct and indirect fire attacks. Non-armored targets may receive up to 200% suppression. Vehicle targets may receive a maximum of 50% suppression. If a unit is attacked more than once in a pulse then its suppression will be cumulative. Suppression will not occur if ATGM weapons fire at armored targets.

The level of suppression added by an attack is equal to (SS × SS × ACCURACY × ACCURACY × WEAPONS FIRING) / 200. For suppression purposes the ACCURACY will always be at least 10.

At the end of each pulse the suppression level of each unit will be halved.

### 7.7 Suppression Effects

Suppression may affect a unit's ability to search, fire or move.

SEARCH: Units with greater than 99% suppression may not search. If suppression is less than 100% then there is a percentage chance, equal to the suppression level, that the unit will fail to search. Units will always search the square they occupy.

FIRE: The effectiveness of fire is reduced by 1/3 the level of suppression (i.e. a unit with a suppression of 180% will have its fire effectiveness reduced by 180/3 or 60%). In addition, ATGMs will have their weapon accuracy rating QUARTERED if suppression is greater than 25.

MOVE: Units with greater than 50% suppression will be **pinned** down and unable to move. Note that armored vehicles will never have greater than 50% suppression.

### 7.8 Ammunition

Most units will start the game with 40 units of ammunition. Units will expend one unit of ammunition each time they fire. Units will be unable to fire if their ammunition reaches zero. Specialized ATGM vehicles will carry 16 missiles. Other ATGM units will carry only 4 missiles. If a vehicle is armed with both cannon and ATGM weapons then the computer will account for both types of ammunition (only the missiles will be displayed until they have been expended after which the cannon or machine-gun ammo will be displayed).

Helicopters will carry 4 ATGMs and 16 ammo except for the APACHE which carries 16 ATGMs and 16 ammo.

### 7.9 Movement

At the end of each pulse, eligible units with movement objectives will move. Units that fired ATGMs or indirect fire or were pinned during the pulse will not move.

At the end of each pulse, moving units accumulate movement points equal to their SP rating (see 6.0). Units will spend movement points to ENTER each square on their path. Listed below are the costs to enter each type of terrain for each type of unit:

| | TRACK | WHEEL | FOOT |
|---|---|---|---|
| clear | 13 | 13 | 13 |
| road | 7 | 3 | 10 |
| town | 10 | 5 | 12 |
| road-slope | 10 | 5 | 12 |
| entrenchment | 20 | 27 | 17 |
| woods | 20 | 27 | 17 |
| slope | 20 | 27 | 17 |
| ford | 30 | 40 | 20 |

All units with SP greater than 12 are TRACKed vehicles. All units with SP equal to 12 are WHEELed vehicles. Units with SP less than 12 are FOOT units.

Helicopters may enter any type of terrain at a cost of 1.3 per square. Helicopter speeds are displayed in increments of 10. Helicopters flying at altitudes less than 2 will have a maximum speed of 9 (90 mph).

The SP rating given to each unit is very close to being equal to the unit's maximum miles per hour speed in clear terrain; when setting speed for the unit you should consider the SP rating to be equal to miles per hour.

### 7.10 Disembarking Under Fire

When vehicles carrying passengers come under fire they may be forced to unload during the combat phase. Any vehicle that suffers 1 or more KILLS must immediately unload its passengers. If a vehicle other than an APC suffers 50% suppression while carrying infantry then it must immediately unload.

If a loaded vehicle suffers KILLS then some or all of the passengers may also be killed prior to unloading.

### 7.11 Combat Reports

During the combat phase the computer will describe the occurrence of direct or indirect fire. The computer will report the size and type of shell being fired and in most instances the KILL and/or SUPPRESSION results.

Listed below are the criteria for describing the size and type of shell being fired:

| | |
|---|---|
| SMALL ARMS FIRE: | RIFLE, CANNON shell size = 1 |
| LIGHT ARTILLERY FIRE: | MOR shell size < = 4 |
| MEDIUM ARTILLERY FIRE: | GUN, HOW, MOR shell size = 5 |
| HEAVY ARTILLERY FIRE: | GUN, HOW shell size > = 6 |
| LIGHT CANNON FIRE: | CANNON shell size = 2 or 3 |
| MEDIUM CANNON FIRE: | CANNON shell size = 4 |
| HEAVY CANNON FIRE: | CANNON shell size > = 5 |
| ATGM LAUNCH: | ATGM launch sighted by defending unit |
| ATGM ATTACK: | ATGM attack resolution |
| SIW ATTACK: | SIW attacking vehicle units |

Armored vehicles with an MP rating of zero and an SS rating greater than 3 are assumed to be firing HOWitzer or mortar weapons. Armored vehicles with an MP rating greater than zero are assumed to be firing CANNON weapons. Vehicles with an MP rating of zero and an SS rating of 1 are assumed to be firing machine guns.

During direct fire any KILLS or SUPPRESSION will always be displayed. During indirect fire KILLS or SUPPRESSION will not be displayed.

### 7.12 Sighting Firing Units

Any unit on the map that employs direct or indirect fire has a random chance of being sighted. The chance of sighting is equal to 2 × TURNS FIRED AT SAME TARGET / RANGE.

### 7.13 Smoke

Smoke may be placed by any artillery that is capable of indirect fire. There are three levels of smoke (1-3), with level 1 representing light smoke and level 3 representing heavy smoke. Artillery delivered smoke will be at level 3 on the turn it is placed. At the end of each pulse there is a random chance that the smoke will be reduced one level or removed from the map. Listed below are the percentage chances for reducing smoke at each level:

| | |
|---|---|
| LEVEL 3 | 90% |
| LEVEL 2 | 70% |
| LEVEL 1 | 50% |

If level 1 smoke is reduced then it will be removed from the map. If a vehicle is destroyed in a square that contains no smoke then a level 1 smoke will be placed in the square.

If smoke exists in a square then a smoke symbol will appear in the square unless the square is occupied by VISIBLE units. If visible units occupy a square with smoke in it then the unit symbol will be displayed instead of the smoke symbol.

Smoke is considered to have a height of 3 from the base height of the terrain in the square. Thus smoke in a level 1/2 forest square would be considered to occupy the height levels of 2, 3, and 4 (see section 8).

### 7.14 Helicopters

Helicopters used in the game have special rules covering their greater mobility, and ability to change altitudes. Speed ratings for helicopters are listed as multiples of 10 (25 = 250 mph). Each time a helicopter unit changes a movement objective or its speed then it will be required to reset its altitude level (1-9). The level of altitude (1 level = 50 meters) represents the height of the helicopters above the terrain in the same square. Thus a helicopter unit flying at level 7 over a level 5/6 town would actually be at level 12 (see section 8). Helicopters with their altitude set at 1 will have a maximum speed of 9 (90 mph).

Flak and SAM units may fire normally at helicopters; all other units have their accuracy divided by 10 when firing at helicopters. Units armed with weapons that have a shell size greater than 3 may not fire these weapons at helicopters. Instead these units will employ "small arms fire" against the helicopters (similar in effect to RIFLE fire). When ground units fire at helicopters 1 will be added to the RANGE for every 3 levels of helicopter altitude.

## 8.0 LINE OF SIGHT

The ability of a unit to see another unit on the map is affected by the terrain that lies between them. To determine if one unit can observe another, the computer will follow the procedures listed below:

(1) Determine the straight line path from the sighting unit to the target unit. This path is the "line of sight" (LOS).

(2) Determine if the range to the target unit is greater than the visibility level, in which case the unit cannot be seen.

(3) Determine if the LOS is blocked (preventing observation) or clear (permitting observation). If any square on the LOS path contains "blocking" terrain then there is a possibility the LOS will be blocked.

(4) There are two types of blocking terrain: ELEVATED terrain and COVER terrain. Elevated terrain is any terrain on the LOS path that has a higher altitude level than both the sighting and target units. Cover terrain consists of TOWN and WOODS terrain squares. SMOKE may have the same effect as cover terrain.

(5) Elevated terrain will always block a line of sight. A LOS may be traced through 2 BLOCKING POINTS of cover terrain and/or smoke. Blocking points for cover terrain are: TOWN = 4, WOODS = 2. Blocking points for smoke equals the smoke level in the squares. Blocking points for cover terrain and smoke in the same square are cumulative. A LOS starts in the sighting unit's square and moves towards the target unit's square; blocking points may be accumulated in each square the LOS passes through. The LOS will stop in the square in which the total blocking points EXCEEDS 2. A target unit MAY be sighted in the square in which the LOS STOPs.

(6) If the LOS is not blocked and the two units are on the same altitude level, then they may observe each other.

(7) If the LOS is not blocked by ELEVATED terrain and the two units are at different altitude levels, then the following formula is used to determine if a LOS exists:

LOS is clear if $[h - (d \times H/D)]^* \geq P$

* Rounds off number to nearest integer.

H = height of higher position minus height of lower position

D = distance from higher position to lower position

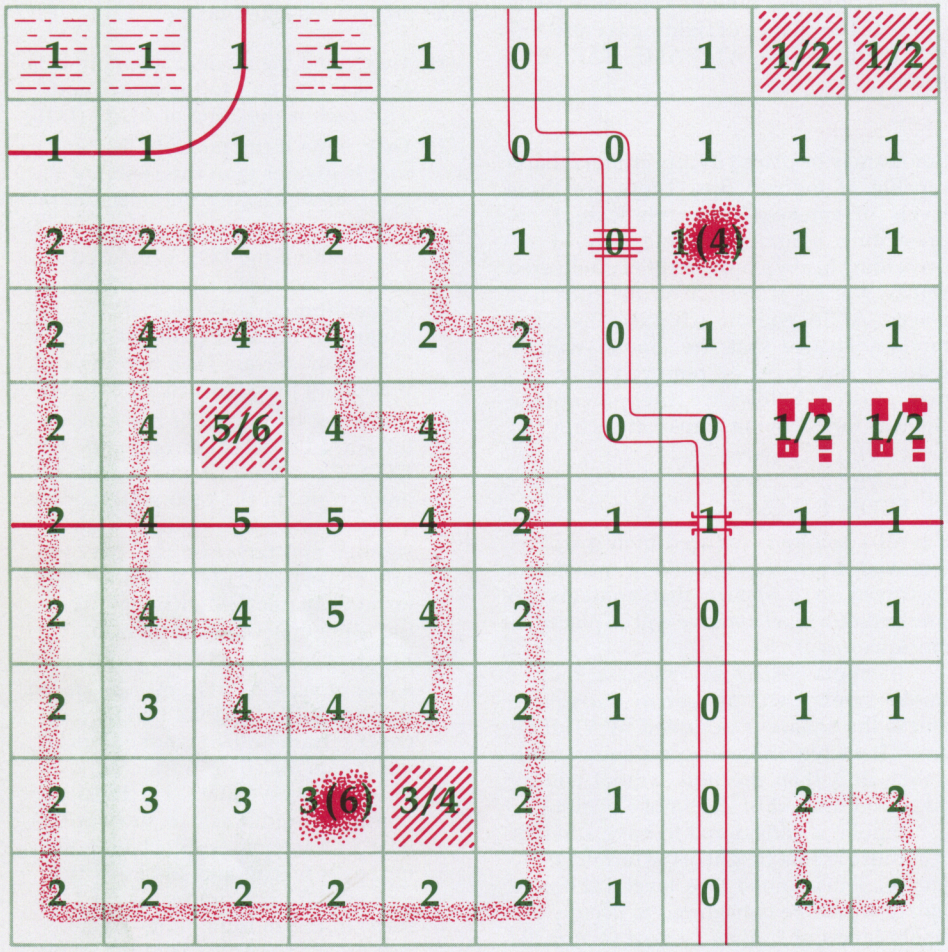
h = height of higher unit

d = distance from potential obstacle to higher position

P = height of potential obstacle

Each square on the path from the higher unit to the lower unit is a potential obstacle. Cover terrain will increase the altitude level of a square by 1 additional level when calculating the value of "O" in the above formula. The following diagram shows the heights of various terrain types on a typical map.

The computer is the final judge in determining LOS. Players may use the (V)iew key to determine which squares are visible from any particular square.



= SLOPE

= TOWN

= WOODS

= FORD

= ROAD

= BRIDGE

= RIVER

= SMOKE

= ENTRENCHMENT

\# = height level of terrain for purposes of blocking line of sight

#/# = (height level of unit in square)/(height level of terrain for blocking line of sight)

(#) = height of smoke

## 9.0 HISTORICAL SCENARIOS

### 9.1 General Custer Rides Again (FULDA May 8, 1990)

This is a Soviet pursuit with a game length of 15 turns. The NATO player begins with 250 victory points, and the Soviet player begins with 1 victory point. On the border of the two Germanys, 25 kilometers west of Fulda, elements of an American armored cavalry regiment defend against an early morning Russian attack. Like General Custer before him, the American cavalry commander gives the command "take no prisoners".

### 9.2 Hold the Line (WURZBURG May 11, 1990)

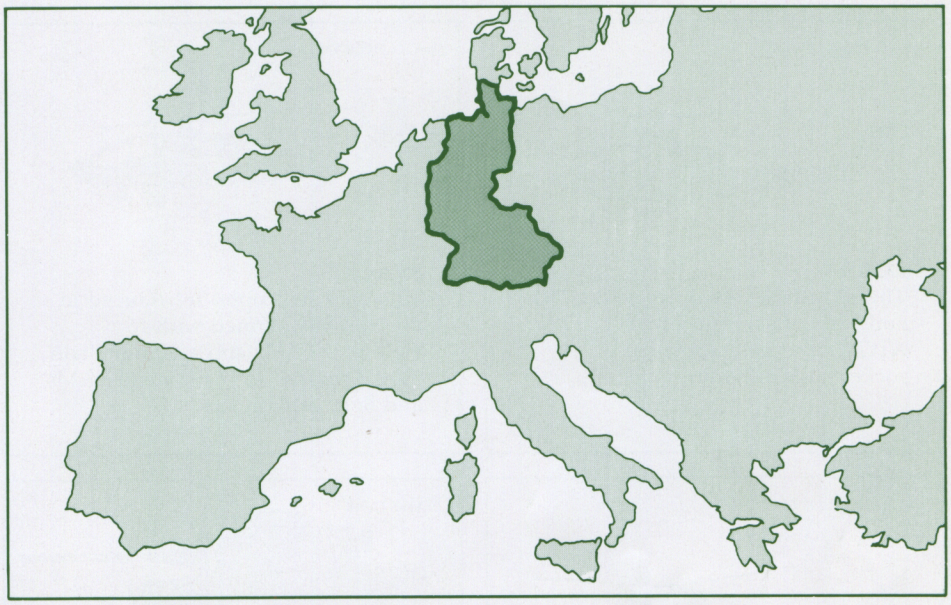
This is a Soviet assault with a game length of 20 turns. The NATO player begins with 1 victory point, and the Soviet player begins with 1 victory point. Just northeast of Wurzburg, the 1st mech battalion of the 3rd mech division deploys in a defense in depth in order to gain time for the coming Reforger units, for the longer the delay, the stronger NATO becomes. The time has come to hold the line.

### 9.3 The Tide Begins to Turn (KARLSRUHE May 25, 1990)

This is a NATO assault with a game length of 20 turns. The NATO player begins with 1 victory point, and the Soviet player begins with 2 victory point. Soviet forces advance on the Rhine at Karlsruhe, only to be faced with a counterattack that begins to encircle them from Stuttgart and Heidelberg. As part of the counterattack, a West German armored battalion reinforced with supporting U.S. Apache helicopters lunges east from Karlsruhe at a startled Soviet mechanized spearhead.

### 9.4 Into the Jaws (OLDENBURG May 26, 1990)

This game is a meeting engagement with a game length of 15 turns. The NATO player begins with 1 victory point, and the Soviet player begins with 1 victory point. A hodgepodge of units from the British 24th brigade



were sent from England to reinforce Bremen, but at the last moment they were redirected to engage a recon unit of a Soviet motorized rifle division which had broken through and was threatening to capture Oldenburg and cut off NATO forces in Bremen.

### 9.5 After Action Reports

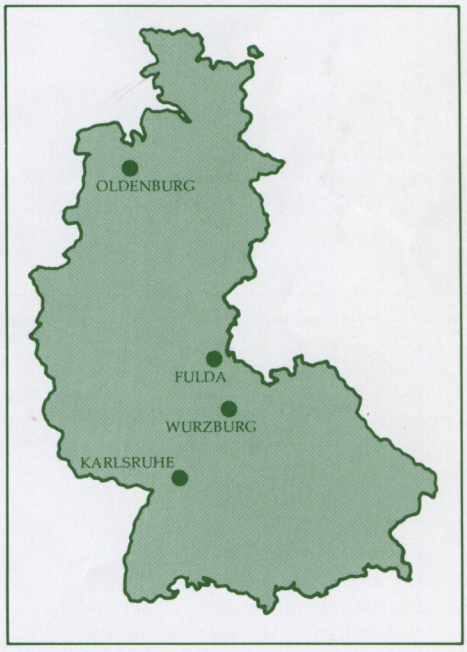
**Fulda** — The Soviets broke through at Hilders after suffering severe losses. The cavalry commander's widow was notified at 1243 hours.

**Wurzburg** — American forces took heavy losses but delayed the Soviets long enough to allow NATO to regroup for the coming counterattack.

**Karlsruhe** — West German forces spearheaded the first major NATO attack. Despite taking large losses, the Soviets are being driven back.

**Oldenburg** — The Brits, suffering near fatal losses, are reorganizing at this very moment after repulsing a concerted Soviet attack.

. . . further action reports later . . .




## 10.0 GAME LENGTH AND VICTORY CONDITIONS

### 10.1 Ending the Game:

The game will automatically end after 15 turns (20 turns if an assault battle is being played). Players may also elect to end the game early if they both agree (use the 0 key), and they may also elect to continue a game that has ended. If they elect to continue a game that has ended, the computer will never again end the game as this must be done by the players.

### 10.2 Victory Conditions:

At the end of the game victory points (VPs) will be awarded as follows:

EACH UNUSED SELECTION POINT ..... 20
(maximum of 250 due to unused selection points)

FORCES IN THE OBJECTIVE AREA:

ARMORED VEHICLE ..... 20

ARTILLERY ..... 10

INFANTRY MAN ..... 5

EACH KILL:

FOOT UNIT ..... TRANSPORT COST

ARMORED VEHICLE ..... 10
plus FRONT ARMOR

Only the attacking player receives points for units in the objective area. When playing a meeting engagement type battle both players receive points for units in the objective area (both players are considered to be the attacker).

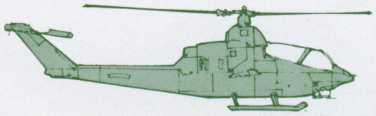
After the victory points have been totaled the defender's points will be *doubled* (points for unused selection value may be doubled to a value no greater than 500).

The computer will divide the total NATO victory points by the total SOVIET victory points to arrive at a victory ratio. Compare this ratio to the following chart to determine the victor:

| | |
|---|---|
| 2.00 and above | NATO Decisive Victory |
| 1.50 – 1.99 | NATO Substantive Victory |
| 1.10 – 1.49 | NATO Marginal Victory |
| 0.92 – 1.09 | Draw |
| 0.67 – 0.91 | SOVIET Marginal Victory |
| 0.51 – 0.66 | SOVIET Substantive Victory |
| 0.50 and below | SOVIET Decisive Victory |

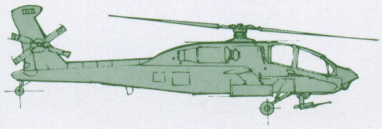
## 11.0 WEAPON NOTES

NATO HELICOPTER



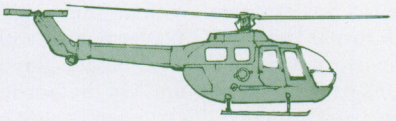
**COBRA**
The US attack helicopter of the 70s and early 80s. Armed with 4 TOW ATGMs and an assortment of rocket pods and mini-guns.

NATO HELICOPTER



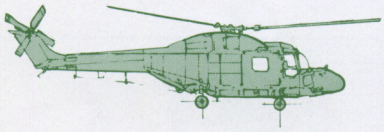
**APACHE**
US attack helicopter introduced in the mid 80s. Armed with 16 Hellfire ATGMs and a 30mm chain gun. Armored to resist small SAMs and light cannon fire.

NATO HELICOPTER



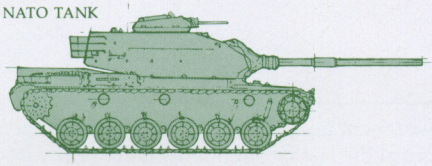
**PAH-2**
West German attack helicopter introduced in the mid 80s. Armed with 4 HOT ATGMs and a 20mm cannon.

NATO HELICOPTER



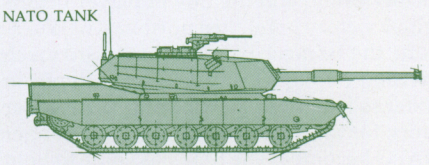
**LYNX-3**
British attack helicopter introduced in the early 80s. Armed with 4 TOW ATGMs and a 20mm cannon.

NATO TANK



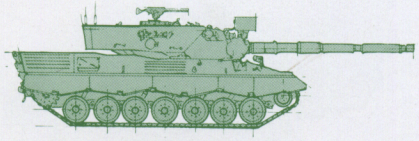
**M60A3**
The most numerous US tank of the 1980s. Armed with a 105mm cannon with a laser range finder, the M60A3 can score consistent kills against any Soviet tank. Its high silhouette, poor mobility and obsolete armor make it a sitting duck on the modern battlefield.

NATO TANK



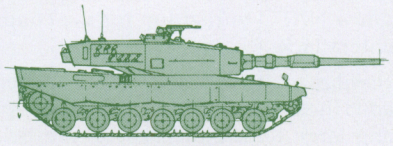
**M1 (ABRAMS)**
The US tank of the 80s and 90s. Armed with a 120mm cannon and a laser range finder; the Abrams can kill any Soviet tank within 3500 yards. Advanced 'Chobham' armor and outstanding mobility make the M1 the most survivable tank on the modern battlefield.

NATO TANK



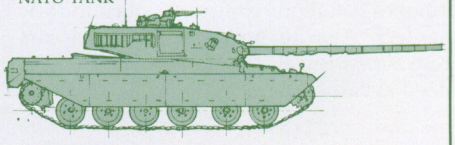
**LEOPARD 1**
The most numerous NATO tank of the 1970s, the Leopard-1 has become obsolete due to recent technological developments. Its 105mm cannon may be ineffective against the new Soviet T-80s.

NATO TANK



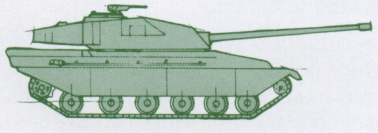
**LEOPARD 2**
The NATO tank of the 80s and 90s. Designed to maximize compatability with the US Abrams, the ammunition and many of the parts will be interchangeable. Performance characteristics should also be very similar to the Abrams.

NATO TANK



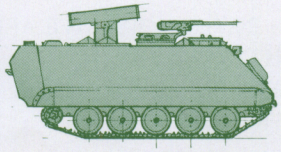
**CHIEFTAIN**
The main British tank of the 70s and 80s. Armed with a 120mm cannon and laser range finder, the Chieftain is still a potent anti-armor system. Poor mobility, a large silhouette and conventional armor will be a disadvantage on the modern battlefield.

NATO TANK



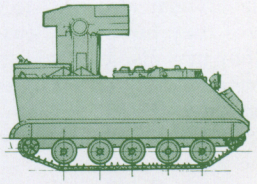
**CHALLENGER**
The British replacement for the Chieftain first deployed in 1985. Features the same excellent weapon systems as its predecessor but now with Chobham armor and improved mobility.

NATO SELF-PROPELLED ATGM



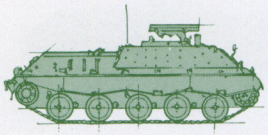
**M150**
A TOW launcher mounted on an M113. Used in most US armored, mechanized and cavalry battalions.

NATO SELF-PROPELLED ATGM



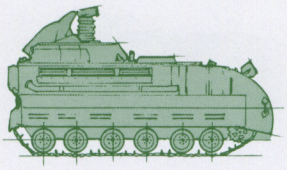
**M901 (Improved TOW Launcher)**
Similar to the M150. The TOW launcher is periscope mounted to permit firing while concealed.

NATO SELF-PROPELLED ATGM



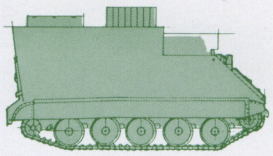
**JAGUAR-1**
A HOT missile launcher mounted on a tracked vehicle. Used in divisional Jagdpanzer Companies.

NATO SELF-PROPELLED ATGM



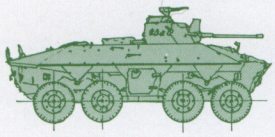
**FV438**
A Swingfire missile launcher mounted on an FV432. Used in divisional anti-tank batteries.

NATO RECON/COMMAND VEHICLE



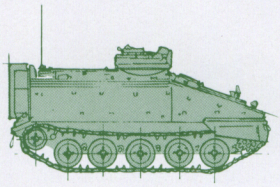
**M577**
An M113 modified to perform a command, communications or electronics role.

NATO RECON/COMMAND VEHICLE



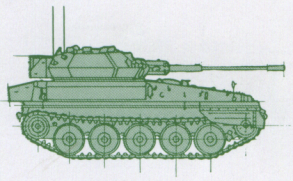
**LUCHS**
A West German armored car armed with a 20mm cannon. Used in Recon Platoons.

NATO RECON/COMMAND VEHICLE



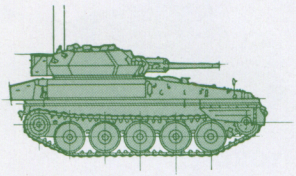
**SPARTAN**
A British armored vehicle used for command, communications or reconnaissance.

NATO RECON/COMMAND VEHICLE



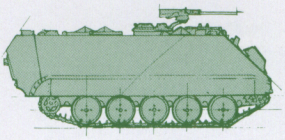
**SCIMITAR**
A British light tank used in close recon squadrons. Armed with a 20mm cannon.

NATO RECON/COMMAND VEHICLE



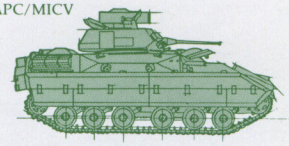
**SCORPION**
A British light tank used in medium recon squadrons. Armed with a 76mm cannon.

NATO APC/MICV



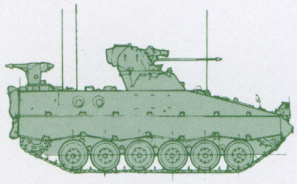
**M113**
The principal US APC of the 60s and 70s. Designed as basic transportation for infantry with limited protection against HE and small arms fire. Still widely used by the US and most NATO allies.

NATO APC/MICV



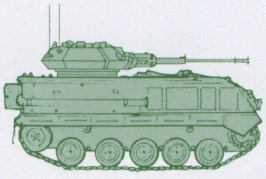
**M2 (BRADLEY)**
Introduced in the mid 80s as the first US MICV. Designed to replace the M113 and perform a more aggressive combat role. Armed with a 25mm chain gun and the TOW ATGM, the Bradley can slug it out with Soviet BMPs or wait in ambush for Soviet T-80s.

NATO APC/MICV



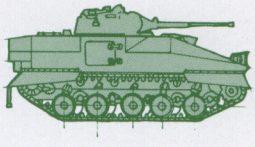
**MARDER**
A West German MICV introduced in the early 70s. Its 20mm cannon is intended to support the infantry squad and kill BMPs.

NATO APC/MICV



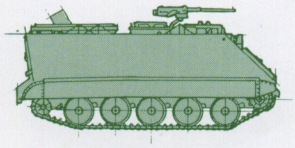
**FV432**
The principal British APC for the last 20 years. Many FV432s are being rearmed with a 30mm cannon to support the infantry squad and kill BMPs.

NATO APC/MICV



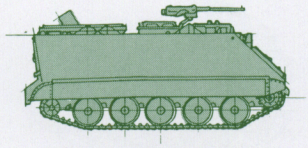
**MCV80**
A British MICV introduced in the mid 80s. Intended as a replacement for the FV432, the MCV80 has superior protection and mobility and mounts the same 30mm cannon.

NATO SELF-PROPELLED MORTAR



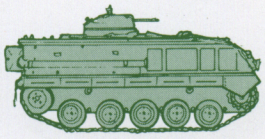
**M106**
A 107mm mortar mounted on an M113. Used in most US Army armored, mechanized or cavalry battalions.

NATO SELF-PROPELLED MORTAR



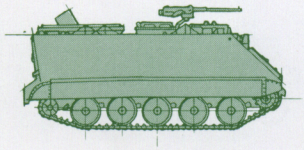
**M125**
An 81mm mortar mounted on an M113. Used in most US Army armored, mechanized or cavalry battalions.

NATO SELF-PROPELLED MORTAR



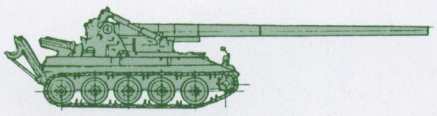
**FV432M**
An 81mm mortar mounted on an FV432. Used in British Mechanized Infantry Battalions.

NATO SELF-PROPELLED MORTAR



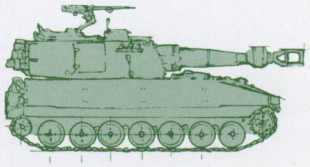
**M113-M**
A 120mm mortar mounted on an M113. Used in West German Panzergrenadier Batrtalions.

NATO SELF-PROPELLED ARTILLERY



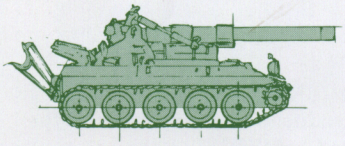
**M107** (not to scale)
A 175mm cannon mounted on a tracked vehicle. Used in West German Artillery Regiments.

NATO SELF-PROPELLED ARTILLERY



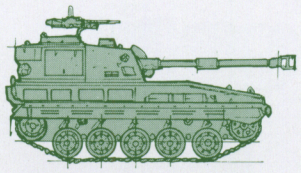
**M109**
A 155mm howitzer mounted on a tracked vehicle. Used in most NATO artillery formations.

NATO SELF-PROPELLED ARTILLERY



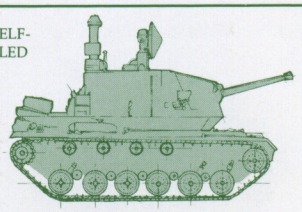
**M110**
A 203mm howitzer mounted on a tracked vehicle. Used in most NATO artillery formations.

NATO SELF-PROPELLED ARTILLERY



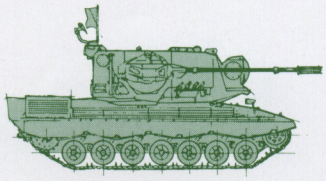
**ABBOT**
A 105mm howitzer mounted on a tracked vehicle. Used in British close support artillery regiments.

NATO SELF-PROPELLED FLAK



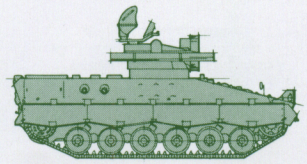
**SGT. YORK**
A US high tech anti-aircraft system mounted on an old M48 chassis. Armed with twin 40mm cannons, radar sensors and computerized fire control. The Sgt. York is far too slow to keep up with the Abrams and Bradleys it is intended to protect.

NATO SELF-PROPELLED FLAK



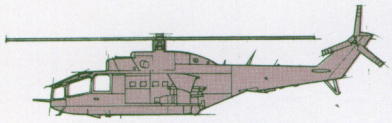
**GEPARD**
A West German battlefield air defense system. Armed with twin 35mm cannons and radar fire control. The Gepard is well armored and can be effective against ground targets.

NATO SELF-PROPELLED SAM SYSTEM



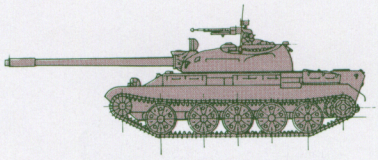
**ROLAND**
A medium range air defense missile used by US and West German forces.

SOVIET HELICOPTER



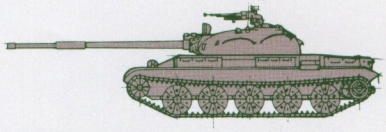
**HIND-D**
Soviet attack helicopter introduced in the early 80s. Armed with 4 Spiral ATGMs and a 23mm cannon.

SOVIET TANK



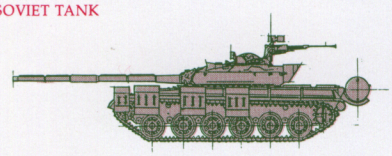
**T-55**
The main Soviet tank of the 50s and early 60s is still found in the inventories of many Warsaw Pact countries. Inferior to modern tanks in firepower, mobility and protection. Armed with a 100mm cannon.

SOVIET TANK



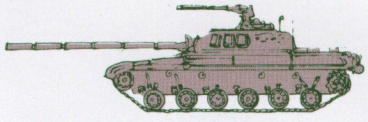
**T-62**
Replaced the T-55 in the mid 60s. Mounts a 115mm cannon with a primitive Stadia range finder. The T-62 has been withdrawn from most Soviet divisions stationed in Eastern Europe. It may still be used as a 'replacement' tank in Soviet independent tank battalions.

SOVIET TANK



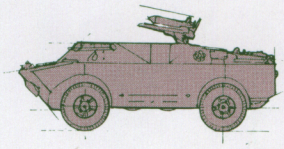
**T-72**
Introduced in the early 70s to replace the troubled T-62. Armed with a 125mm cannon, laser range-finder and automatic loader, the T-72 represents a technological leap in Soviet tank design. Will remain in frontline service into the 1990s.

SOVIET TANK



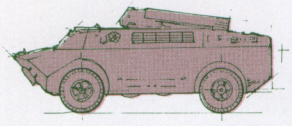
**T-80**
Designed as the Soviet tank of the 80s and 90s. Production has been slowed by Soviet attempts to incorporate the advanced (Chobham) armor technology. Employs the same weapon and fire control systems as the T-72.

SOVIET SELF-PROPELLED ATGM



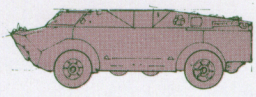
**BRDM-2**
A Sagger missile launcher mounted on a BRDM scout car. Used in Anti-tank batteries attached to the Motorized Rifle Regiments.

SOVIET SELF-PROPELLED ATGM



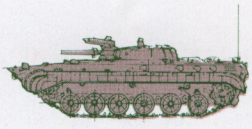
**BRDM-3**
A Spandrel missile launcher mounted on a BRDM. It is replacing the BRDM-2.

SOVIET RECON/COMMAND VEHICLE



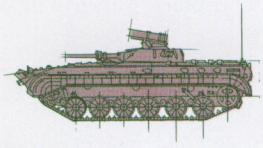
**BRDM**
A Soviet armored car used for command or reconnaissance.

SOVIET APC/MICV



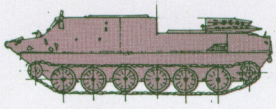
**BMP-1**
The original MICV, introduced by the Soviets in the mid 60s. Armed with a 73mm cannon and the Sagger ATGM.

SOVIET APC/MICV



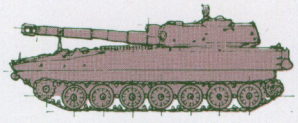
**BMP-2**
A significant improvement over the BMP-1. The BMP-2 features improved protection, mobility, gun stabilizers and the new Spandrel ATGM.

SOVIET SELF-PROPELLED MORTAR



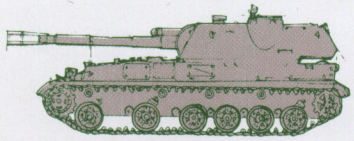
**BTR-50m**
A 120mm mortar mounted on a BTR-50 APC. Used in Soviet Motorized Rifle Battalions.

SOVIET SELF-PROPELLED ARTILLERY



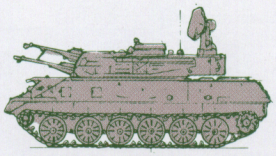
**M-1974**
A 122mm howitzer mounted on a tracked vehicle. Used in Soviet Divisional Artillery Regiments. M-1974 Battalions may be attached to Soviet Tank or Motorized Rifle Regiments.

SOVIET SELF-PROPELLED ARTILLERY



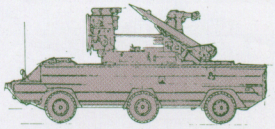
**M-1973**
A 152mm howitzer mounted on a tracked vehicle. Used in Soviet Divisional Artillery Regiments.

SOVIET SELF-PROPELLED FLAK



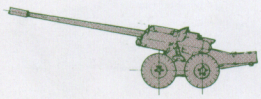
**ZSU23/4**
A Soviet flak system armed with quad 23mm cannons and radar fire control.

SOVIET SELF-PROPELLED SAM SYSTEM



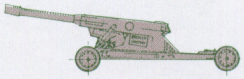
**SA-8**
A medium range air defense missile used in Soviet Tank and Motorized Rifle Divisions.

SOVIET TOWED ARTILLERY



**130mm GUN**
Used in Soviet independent artillery regiments.

SOVIET TOWED ARTILLERY



**180mm GUN**
Used in Soviet heavy artillery battalions.

## WEAPONS NOT SHOWN:

### NATO ANTI-TANK GUIDED MISSILES

**DRAGON**
An infantry portable wire-guided missile used in US Mechanized Infantry Platoons. May be ineffective against the new T-80 tanks.

**TOW3**
A wire-guided missile mounted on the US Army M150, M901 and Bradley tracked vehicles and the US Cobra and British Lynx-3 helicopters. Effective against all Soviet tanks.

**HELLFIRE**
A laser-guided missile carried by US Apache helicopters. Effective against all Soviet tanks.

**MILAN**
An infantry portable wire-guided missile used in British and West German mechanized battalions. May be ineffective against the T-80.

**HOT**
A wire-guided missile mounted on the West German Jaguar-1 tracked vehicle and PAH-2 helicopter. Effective against all Soviet tanks.

**SWINGFIRE**
A wire-guided missile mounted on the British FV438 tracked vehicle. May be ineffective against the T-80.

### NATO LIGHT ANTI-TANK WEAPONS

**LAW**
A light anti-tank rocket launcher used by US and British infantry squads.

**PZF44**
Similar to the LAW. Used in West German infantry squads.

### NATO AIR DEFENSE MISSILES

**RAPIER**
A medium range SAM used in British Air Defense Regiments.

**STINGER**
A short range SAM used in US combat support companies and West German anti-aircraft battalions.

**BLOWPIPE**
A short range SAM used in British Divisional Air Defense Batteries.

### SOVIET ANTI-TANK GUIDED MISSILES

**SAGGER**
A wire-guided missile mounted on the Soviet BMP-1 and BRDM-2 armored vehicles. Ineffective against tanks with chobham armor.

**SPANDREL**
A wire-guided missile mounted on the Soviet BMP-2 and BRDM-3 armored vehicles. Limited effectiveness against tanks with chobham armor.

**SPIRAL**
A laser-guided missile carried by Soviet Hind-D helicopters. Effective against all tanks.

### SOVIET AIR DEFENSE MISSILE

**SA-7**
A short range SAM used in Soviet infantry platoons.

### SOVIET LIGHT ANTI-TANK WEAPON

**RPG-7**
A light anti-tank grenade launcher used by Soviet infantry squads.

## 12.0 STRATEGY NOTES

### Deployment

When deploying on defense, you should entrench your infantry near the forward edge of the objective area in company size positions. Position your ATGM's and some of your armored vehicles behind this line by several squares. Place your mortars, artillery and main HQ behind your lines near the edge of the board, preferably accompanied by several SAM and flak units. Place your artillery observers (artillery battalion HQ units) 5-10 squares behind the infantry on hilltops which have clear fields of vision of probable approach routes. You are attempting to create a situation in which enemy tanks first encounter your infantry positions, and then almost simultaneously receive ATGM and heavy anti-tank fire. Try to keep at least one company of tanks in reserve, committing them only once the axis of the main enemy attack is determined. When attacking, place your infantry in APC's and set up in a tight formation no more than 5-10 squares wide. Consider splitting off a task force of one tank company and one infantry company (or even better a helicopter squadron) to flank the enemy defensive positions.

### Command Control

Be sure to protect your main HQ by placing it in the rear, but keep it on a hilltop if possible so that it can call in artillery fire with a minimum delay if your forward observers are eliminated. Keep your HQ units 1-2 squares behind the units they are commanding. High level HQ's such as Soviet and British tank regiment HQ's and all infantry battalion HQ's should only be committed to combat when absolutely necessary.

### Firing on the Move

In Mech Brigade, units can fire while moving, although with greatly reduced accuracy. If you wish to fire with full ability while taking advantage of cover terrain in the unit's square, but you also want to keep the unit's current movement objective, set the unit's speed to 0. Even if you don't want to keep the current movement objective, it is better to set the speed to 0 than to use the (K) cancel command, since the cancel command will eliminate any pulses fired at target that may already have accumulated.

### APC's, Infantry, and Smoke

Never allow moving infantry to be spotted by enemy forward observers. Artillery is much too powerful against moving infantry to allow this. Always move your infantry forward in APC's, only dismounting when you are within small arms range of the defending forces. Use of smoke to cover infantry assaults is essential. Concentrate on shielding your units from probable observer positions.

### Smoke

Smoke can be used to separate the defending force into many small pieces, each to be destroyed piecemeal. On defense, smoke can be used to block those attacking units that have stopped to provide covering fire for the moving attackers. The problem with smoke is that you need a lot of it due to the lack of control of its scattering and its quick dissipation. But don't forget that although you can see through low levels of smoke, fire accuracy will still be significantly reduced.

### Weapons

At least 50% of the strategy in Mech Brigade is derived from the differences between weapons systems. It is essential that you study your weapons when beginning a scenario, as well as attempt to predict which weapons you will face. Try to establish at what range you will attempt to engage enemy tanks. For example if you have T-72 tanks and expect to face Abrams tanks, it would be foolish to close to 1600 yards, stop and exchange fire. The sound strategy would be to close to within at most 1000 yards before stopping to fire. The key is understanding under what conditions your weapons have an acceptable chance of defeating the enemy.

### Helicopters

Helicopters have three major functions. They can be used to recon enemy positions, as they are especially useful at sighting enemy attacking columns. They can be used to fly around enemy positions in order to destroy artillery units and HQ's hiding in rear areas. They can also be used as tank hunting systems, first destroying enemy SAM and flak units and then taking their time eliminating large numbers of helpless enemy vehicles. If you expect your opponent to use helicopters, it is wise to purchase extra anti-aircraft units (you will need them).

### Special Infantry Weapons

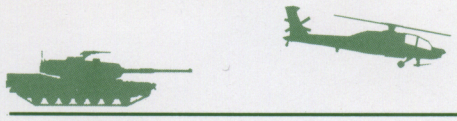
Infantry defending in cover terrain cannot be seen until either an enemy unit enters its square or the infantry unit opens fire. For this reason it is often wise to set the target selection range of defending infantry to zero. This will allow the infantry to ambush enemy units that enter its square. The weakness of this strategy is that each defending square, once discovered, can be attacked piecemeal. When attacking against the 0 range strategy, it is best to send infantry one square ahead of the attacking tanks, as it is much better to have your infantry ambushed than your tanks. If you don't have time for a slow infantry advance, be sure to put infantry on your tanks (or in accompanying APC's), for if your tanks are ambushed, at least your infantry will dismount and fire back in defense of the tanks.

### Suppression

In Mech Brigade, once a unit has been fully suppressed (100+), it may easily be destroyed by a unit entering its square. The key is to identify soft-targets, keep them suppressed, and then send in at least one unit to close assault the defender. Using small arms and artillery fire to suppress armored vehicles can also be useful, as it can help keep the vehicles from acquiring new targets.

### The Combined Arms Concept

Mech Brigade rewards those who are able to use combined arms tactics. On the attack, artillery should be used to cover the advance with smoke, suppress enemy infantry and ATGM teams, and help suppress enemy vehicles. Infantry is needed to suppress and then assault defending infantry positions, as well as help in suppressing enemy vehicles. Tanks can be used to destroy enemy vehicles and overrun suppressed enemy infantry and ATGM positions. Recon vehicles and light tanks should be positioned several squares ahead of the assault elements in order to spot enemy positions and draw fire from anti-armor weapons, thus exposing them to your counter fire. On defense, use infantry to ambush tanks and suppress any units that come too close. Artillery can be used to keep attacking infantry pinned down. while ATGM systems attack vehicles that are mixing it up with the defending infantry. Tanks should be used as a mobile reserve, fighting off major armored thrusts or counterattacking unsupported infantry attacks.



## APPENDIX 1: KILL PROBABILITIES

| FIRING VEHICLE (Soviet) | TARGET VEHICLE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ABRAMS | | | M60A3 | | | BRADLEY | | |
| | 800 | 1600 | 2400 | 800 | 1600 | 2400 | 800 | 1600 | 2400 |
| T-80 | 93.7 | 35.8 | 26.6 | 182.3 | 156.3 | 126.2 | 109.4 | 93.8 | 79.4 |
| T-62 | 5.1 | 3.0 | 1.5 | 48.5 | 28.2 | 14.6 | 31.2 | 21.1 | 12.9 |
| BMP-2 | 5.0 | 1.9 | — | 47.5 | 9.0 | — | 40.8 | 20.5 | — |

| FIRING VEHICLE (NATO) | TARGET VEHICLE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | T-80 | | | T-72 | | | BMP-2 | | |
| | 800 | 1600 | 2400 | 800 | 1600 | 2400 | 800 | 1600 | 2400 |
| ABRAMS | 74.3 | 28.4 | 21.1 | 109.4 | 93.8 | 75.9 | 72.9 | 62.5 | 52.9 |
| M60A3 | 68.9 | 26.3 | 9.8 | 109.4 | 93.8 | 70.6 | 72.9 | 62.5 | 52.9 |
| BRADLEY | 2.5 | 1.4 | — | 4.5 | 2.6 | — | 47.7 | 13.8 | — |

Hit probability of one vehicle firing its cannon after having previously fired for at least 3 pulses. Target front armor is being fired at, target in clear terrain and not moving with no intervening blocking points. Hit probabilities at 800, 1600, 2400 yards (i.e., a T-80 has a 93.7% chance of killing an ABRAMS at 800 yards range).

## APPENDIX 2:
## PROGRAM TO DETERMINE KILL PROBABILITIES FOR DIRECT FIRE VS. ARMORED VEHICLES

We invite you to use the program shown below to calculate kill probabilities for cannon fire directed against armored vehicles.
**(Atari users:** For lines 4-28, replace **INPUT "X?" ; Y** with **PRINT "X" ; : INPUT Y.)**

```
 4 INPUT "RANGE TO TARGET?" ; A                    Input range to target.
 6 INPUT "MR?" ; B                                 Input maximum range of gun.
 8 INPUT "MP?" ; C                                 Input maximum penetration of gun.
10 INPUT "SS?" ; D                                 Input shell size of gun.
12 INPUT "AC?" ; E                                 Input accuracy of gun.
14 INPUT "FIRING UNIT SPEED?" ; SF                 Input speed of firing unit.
16 INPUT "TARGET ARMOR?" ; F                       Input front or back armor of target.
18 INPUT "TARGET SPEED?" ; ST                      Input speed of target unit.
20 INPUT "SL?" ; G                                 Input silhouette of target.
22 INPUT "PULSES FIRED AT TARGET?" ; H             Input pulses fired at target.
24 IF H > 4 THEN H = 4                             Pulses fired at target cannot exceed 4.
26 INPUT "NUMBER OF BLOCKING POINTS?" ; BP         Input number of blocking points between firing and target units.
28 INPUT "NUMBER OF WEAPONS FIRING?" ; N           Input number of weapons firing.
30 IF B = 0 THEN B = 1                             Set B to avoid DIVIDE BY 0 error.
32 AC = ( ( (B - A) * 90 / B) + (H * E) ) ^ 2 / 100   Calculate accuracy (C-64 users: Use ↑ key instead of (^)).
34 AC = AC * G / 4                                 Adjust accuracy for silhouette size.
36 IF ST > 0 THEN AC = AC / (2 + (ST / 10))        Adjust accuracy for speed of target unit.
38 IF SF > 0 THEN AC = AC / (2 + (SF / 10))        Adjust accuracy for speed of firing unit.
40 AC = AC * 2 / (2 + BP)                          Adjust accuracy for blocking terrain and/or smoke.
42 PE = ( (D * D) / 4) + C - (C * (A / B) / 2)     Calculate adjusted penetration factor.
44 IF PE < F THEN AC = AC / 2                      Adjust accuracy if penetration is less than armor.
46 IF PE < F * 1.25 THEN AC = AC / 2               Adjust accuracy if penetration is less than (1.25 * ARMOR).
48 IF PE > 2 * F THEN PE = 2 * F                   Adjusted penetration cannot be greater than (2 * ARMOR).
50 KI = (AC * PE * N) / (1000 * F)                 Calculate expected number of kills.
52 KI = INT (1000 * (KI + .0005) ) : KI = KI / 1000   Round off expected number of kills.
54 PRINT "EXPECTED NUMBER OF KILLS EQUALS  "; KI   Print expected number of kills.
```

— Divide the expected number of kills by 3 if the target is in cover terrain and has a current speed of 0.

If the program above was executed, the result would look like the following example:

```
RANGE TO TARGET? 12
MR? 18
MP? 45
SS? 5
AC? 50
FIRING UNIT SPEED? 0
TARGET ARMOR? 36
TARGET SPEED? 0
SL? 4
PULSES FIRED AT TARGET? 4
NUMBER OF BLOCKING POINTS? 0
NUMBER OF WEAPONS FIRING? 10
EXPECTED NUMBER OF KILLS EQUALS 2.663
```

In this example, a company of ten T-80 tanks is firing at an enemy ABRAMS group. The range is 12 (2400 yards), and the shots are fired at the front armor of the ABRAMS's. The expected result is that 2.663 ABRAMS tanks will be destroyed.

# APPENDIX 3: TERRAIN SYMBOLS

0 Clear (Level 1)

1 Road (Level 1)

2 Road (Level 1)

3 Road (Level 1)

4 Road (Level 1)

5 Road (Level 1)

6 Road (Level 1)

7 Road (Level 1)

8 Town (Level 1/2)

9 Woods (Level 1/2)

10 Entrenchment (Level 1/2)

11 Slope (Level 2)

12 Slope (Level 2)

13 Slope (Level 2)

14 Slope (Level 2)

15 Slope (Level 2)

16 Slope (Level 2)

17 Road/Slope (Level 2)

18 Road/Slope (Level 2)

19 River (Level 0)

20 River (Level 0)

21 River (Level 0)

22 River (Level 0)

23 River (Level 0)

24 River (Level 0)

25 Bridge (Level 1)

26 Bridge (Level 1)

27 Ford (Level 0)

28 Ford (Level 0)

29 Clear (Level 3)

30 Road (Level 3)

31 Road (Level 3)

32 Road (Level 3)

33 Road (Level 3)

34 Road (Level 3)

35 Road (Level 3)

36 Road (Level 3)

37 Town (Level 3/4)

38 Woods (Level 3/4)

39 Entrenchment (Level 3/4)

40 Slope (Level 4)

41 Slope (Level 4)

42 Slope (Level 4)

43 Slope (Level 4)

44 Slope (Level 4)

45 Slope (Level 4)

46 Road/Slope (Level 4)

47 Road/Slope (Level 4)

48 Clear (Level 5)

49 Road (Level 5)

50 Road (Level 5)

51 Road (Level 5)

52 Road (Level 5)

53 Road (Level 5)

54 Road (Level 5)

55 Road (Level 5)

56 Town (Level 5/6)

57 Woods (Level 5/6)

58 Entrenchment (Level 5/6)

## CREDITS

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Apple Sound Effects
**Jack Avery**

Special Computer Graphics Tools
**Keith Brors**

Customized Disk Operating System
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**A&a Printers and Lithographers**

## UNIT ORDERS MENU

(1-8) Move cursor.

(A)* Advance. This command is only used when the computer is in all-units mode. The formation HQ will move to the cursor location; other units in the formation will move in such a way as to retain their current position relative to the HQ.

(B) Bombard. The cursor location is the target square; the current unit is the spotter; the computer will list the artillery units eligible to bombard the target (see section 5.6).

(C) Center. The map is centered around the cursor.

(D) Disembark. If the current unit is a vehicle then it will unload all of its passengers; if the current unit is a passenger then only that unit will unload; unloaded passengers will have a suppression level of 80.

(E) Embark. Order must be given to a vehicle unit — the computer will request the ID of the unit to be embarked (see section 5.4).

(F)* Change unit facing.

(H) Find unit's HQ. Cursor moves to unit's HQ location; computer determines if a "command control" link exists between the current unit and the HQ; the HQ becomes the new current unit.

(I) Inspect. Allows the player to inspect all enemy units that can be seen by the current unit; allows the current unit to designate a priority target and/or request a bombardment (with the current unit as the spotter). Assigning a priority target with the (I)nspect order will cause a range order to be given if the target is outside of the set maximum range, with the maximum firing range being set equal to the distance to the new target (see section 5.8).

(K)* Cancel all orders. Allows the current unit to cancel all movement and bombardment orders.

(L) Look for unit. Moves the cursor to the current unit's location.

(M)* Move unit. Orders the unit to move to the cursor location (see section 5.5).

(N) Next unit. The next higher numbered unit will become the current unit.

(O) Check movement objectives. Moves the cursor to the movement objective location(s) of the current unit; also lists the command control delay (see section 5.5).

(P) List passengers. Lists all units embarked aboard the current unit.

(Q) Quit the unit orders menu. Return to the map display menu.

(R)* Set maximum firing range at which the current unit will select targets (see section 5.7).

(S)* Set movement speed for the current unit.

(T) Inspect the target that the current unit has selected.

(V) View. The computer will inverse all squares that the current unit can see with its current facing.

(X) Exit the unit orders menu. Return to the map display menu.

(Z) Shift to all-units mode.

* This order may be given to all of the units of a particular formation.

## MAP DISPLAY MENU

(1-8) Move cursor.

(0) End game.

(A-U) Select unit. Press formation letter followed by unit index number — computer will shift to UNIT ORDERS MENU; the selected unit will be the "current unit".

(V) View. The computer will inverse all squares that can be seen from the cursor location.

(W) Move cursor to center of objective area.

(X) Exit orders phase.

(Y) Clear units and smoke from screen to view terrain.

(Z) Examine friendly or visible enemy units at cursor location.

## HEADQUARTER SYMBOLS

division

brigade

regiment

battalion

company/squadron/troop/battery

platoon

## TERRAIN COSTS

| | | TRACK | WHEEL | FOOT |
|---|---|---|---|---|
| | clear | 13 | 13 | 13 |
| | road | 7 | 3 | 10 |
| | town | 10 | 5 | 12 |
| | road-slope | 10 | 5 | 12 |
| | entrenchment | 20 | 27 | 17 |
| | woods | 20 | 27 | 17 |
| | slope | 20 | 27 | 17 |
| | ford | 30 | 40 | 20 |
| | bridge | 7 | 3 | 10 |
| | smoke | (no additional cost) | | |

If you have any questions or problems regarding the program or game, please send a self-addressed, stamped envelope with your question to: *STRATEGIC SIMULATIONS, INC., 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043-1983.*

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